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Place [for] the Children

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place [for] the children

by Heather Hudson

A Terminal Project
Presented to the Faculty of
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abstract

Due to changing social and economic trends, enrollment in child care has become customary for the large majority of children under the age of five in the U.S. Although the importance of the early years has slowly begun to gain more recognition, early childhood development and education is still not viewed as the imperative societal issue that it demands. As the widespread environment for raising children in the U.S. has gradually moved from the informal atmosphere of the home to the formal settings of a child care center, the impact of the built environment on children's development has often been overlooked. Brain research indicates that children are born ready to learn, while absorbing every aspect of their environment.

Place [for] the children is a graduate design thesis that explores the relationship between children and architecture asking the question, how can architecture serve as an educational aid in early learning? The intent was to create a multisensory environment in which the architecture, playing an integral role in the educational process, fosters experiential learning. The goal was to help children learn how to learn, while provoking discovery and promoting creative thinking. This project is an investigation into how early childhood design can be rethought, redefining a daycare center as an educational facility in which children learn through interactions and experiences, stemming from their environment.

how can architecture serve as an educational aid in early learning?

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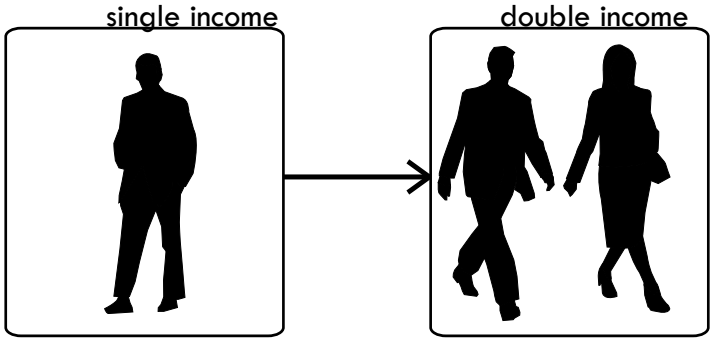
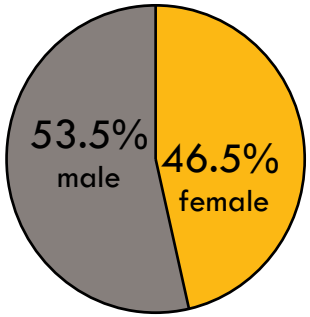
research

Due to the changing social and economic trends, enrollment in child care has become customary for the large majority of children under the age of five in the U.S. In 2008, there were more than 11 million children in child care, placing care giving among the fastest growing occupations in the U.S. (Olds, 2001) It is estimated that 60 million square feet of space will be required each year to keep up with the vigorous rise in children needing care across the country.

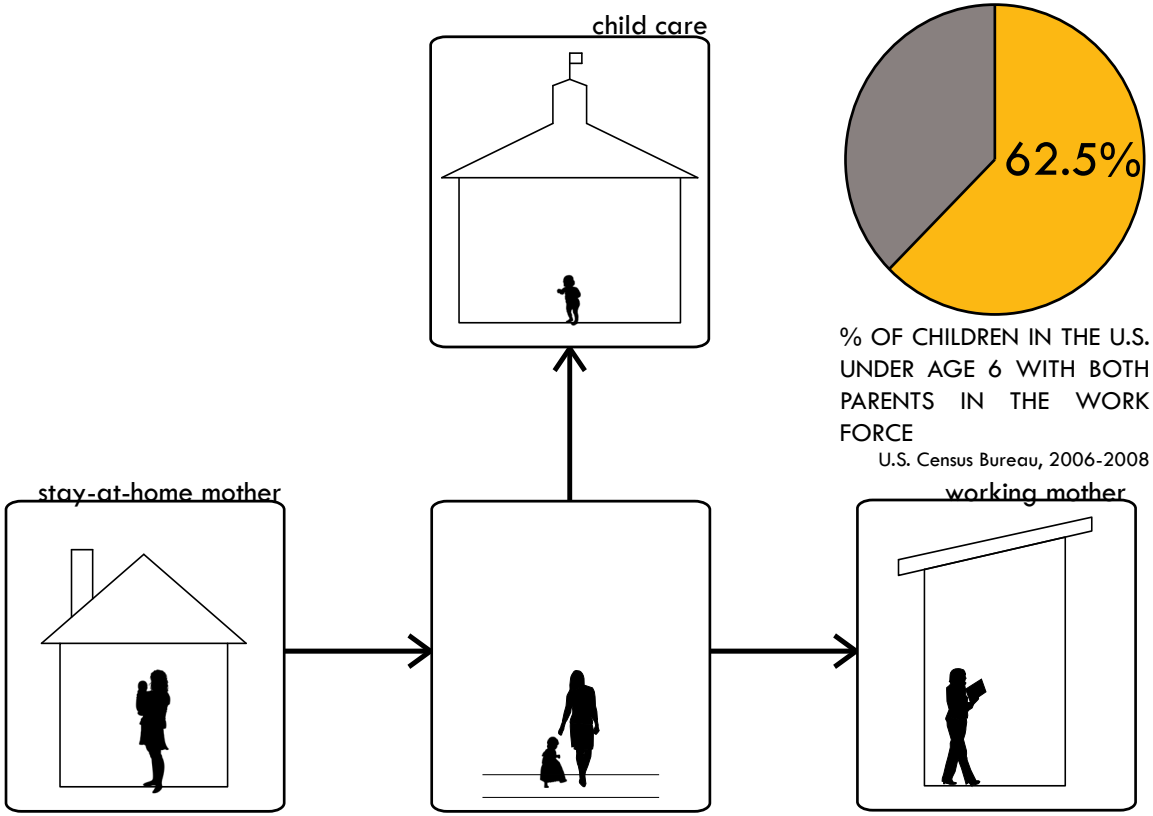


ECONOMIC TRENDS

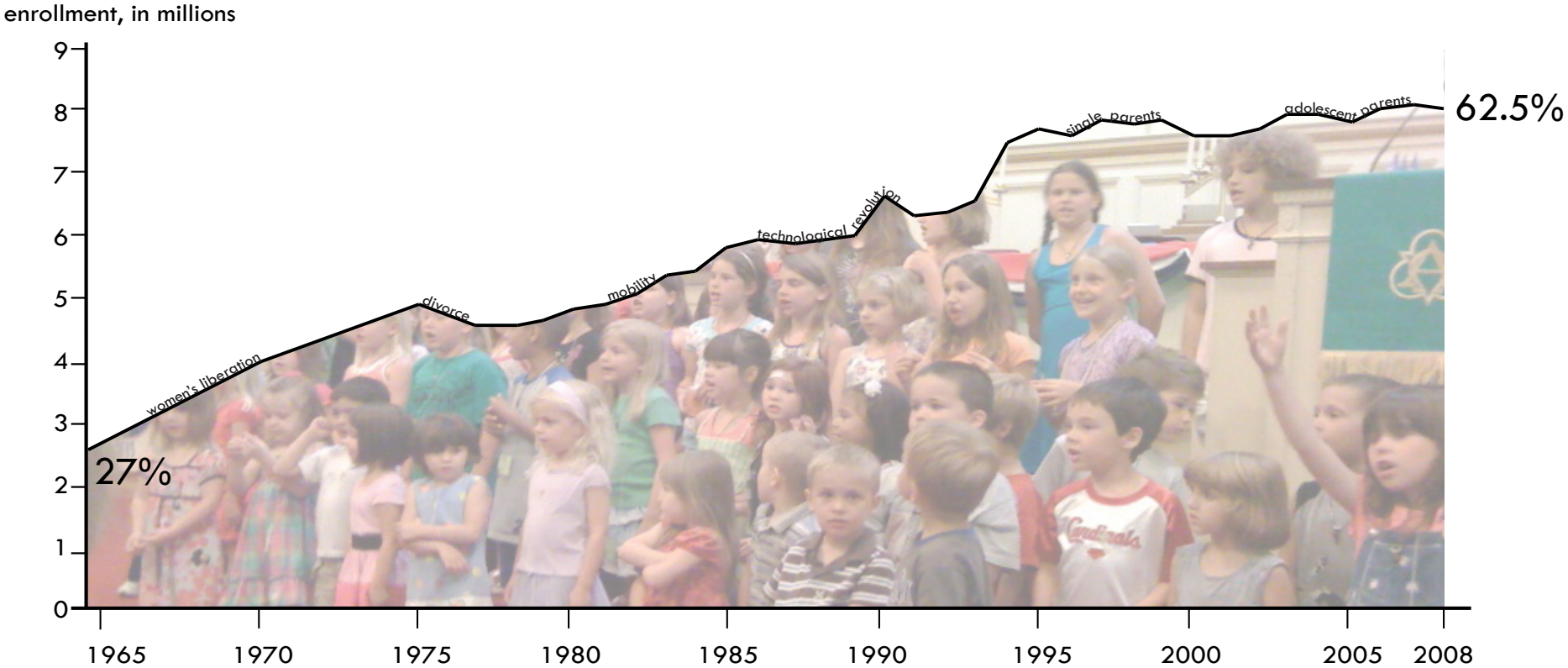


LABOR FORCE BY GENDER
U.S. Census Bureau, 2006-2008

% OF CHILDREN IN THE U.S. UNDER AGE 6 WITH BOTH PARENTS IN THE WORK FORCE
U.S. Census Bureau, 2006-2008



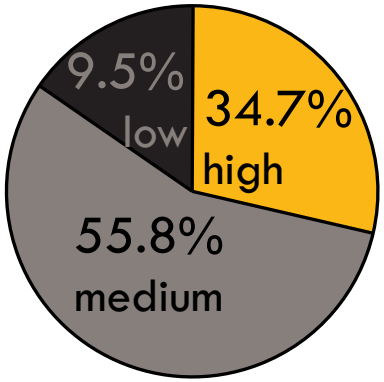
SOCIAL TRENDS



PRE-PRIMARY ENROLLMENT OF 3- TO 5-YR-OLDS IN THE U.S.

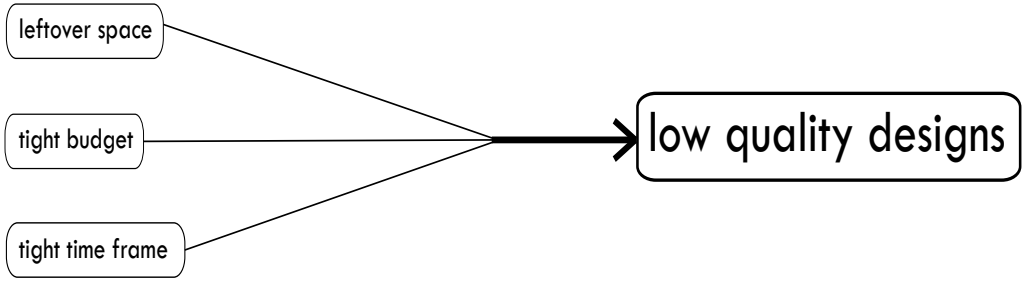
U.S. Department of Education, Oct. 1976-Oct. 2008

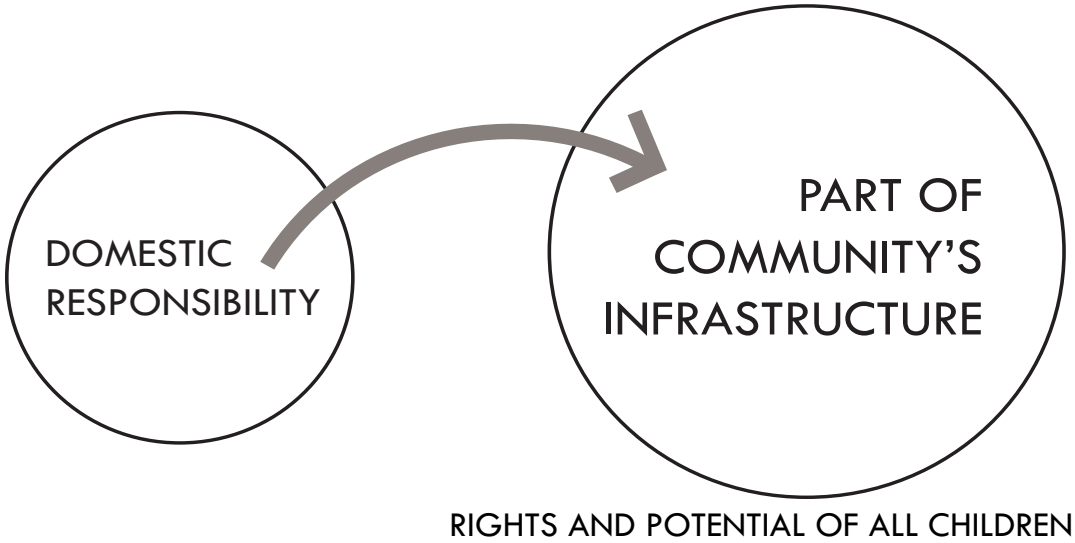
*Quality rating based on the Early Childhood Environment Rating Scale (ECERS). The rise in enrollment has increased the need for conscious design, because the majority of centers have responded to the demand with quantity instead of quality. In May 2010, the National Institute of Child Health and Human Development (NICHD) released a report that found that high-quality child care has a long-lasting impact on a child's development, behavior and cognitive abilities. (National Institutes of Health, 2011)



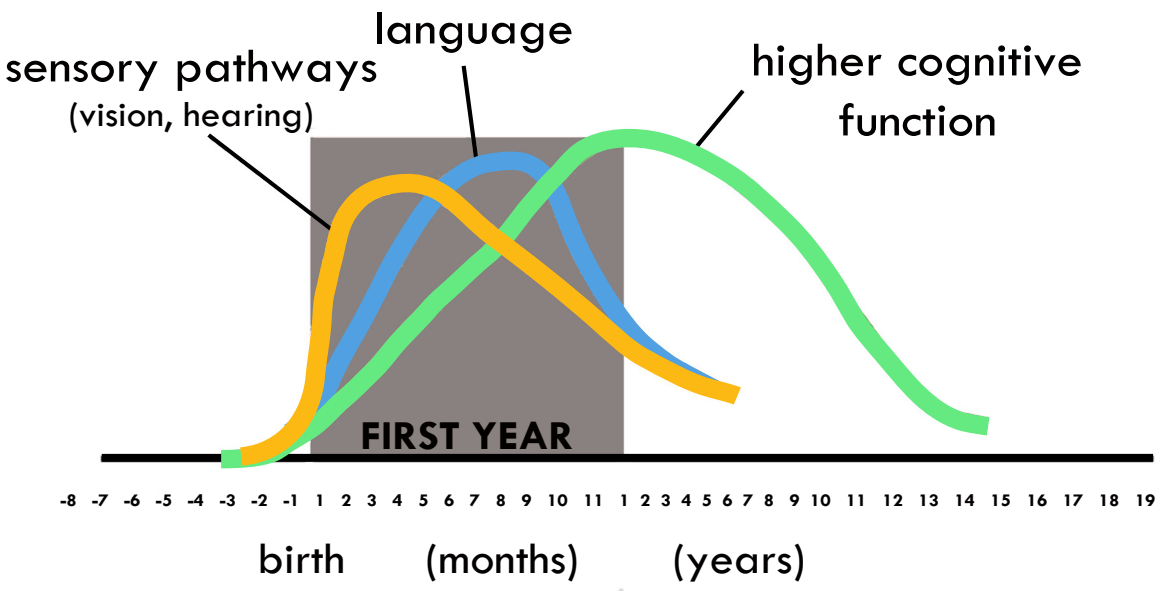
% DISTRIBUTION OF QUALITY* RATING OF CENTER-BASED PROGRAMS AT AGE 4

U.S. Department of Education, 2005-06



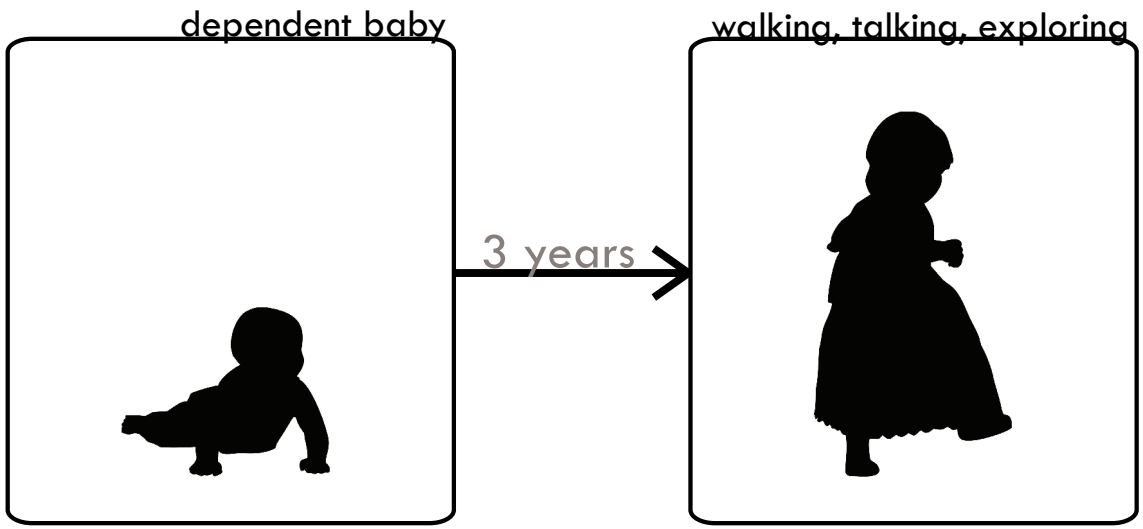


As the widespread environment for raising children in the U.S. has gradually moved from the informal atmosphere of the home to the formal settings of a child care center, the impact of the built environment on children's development has often been overlooked. Although the importance of the early years has slowly begun to gain more recognition, early childhood development and educations is still not viewed as the imperative societal issue that it demands. The investment in the first five years can create long-term savings to other public systems such as education and health care, as well as mold the future of society. Architecture involves designing for the future and children represent our future.



HUMAN BRAIN DEVELOPMENT
Nelson, 2000

Brain research indicates that children are born ready to learn. The neural connections for different functions develop sequentially, with the growth of the brain reaching 80% adult size by the age of three and 90% by age five. "Early experiences determine whether a child's developing brain architecture provides a strong or weak foundation for all future learning, behavior, and health. The brain is built over time, from the bottom up and a substantial proportion is constructed during the early years." (Center on the Developing Child, 2007) With the environment having a direct effect on development, architects need to respond to this essential need for quality child care design.

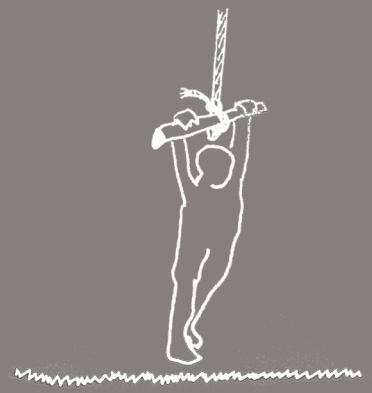


Unlike an adult's relationship to the environment, children use places for sensory experiences rather than for pre-defined purposes. Through sensorial exploration, children absorb every aspect of their environment. Attention needs to be given to the effects of the built environment on a child's development.

children's environmental needs

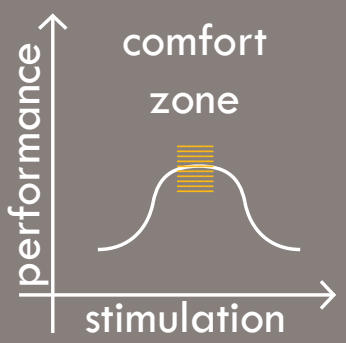
movement

.movement is considered to be the foundation for ***COGNITIVE*** development
.large muscle activity promotes ***PHYSICAL*** development
.indoor supports for large muscle activity (climbers, lofts, platforms, nets, ladders, bouncy surfaces, movement areas, and equipment with movable parts)
.opportunities to run, climb, swing, slide, and crawl outdoors
.resolves the tension between children's need to move and caregivers needs to organize the movement



comfort

.moderate levels of stimulation create feelings of comfort
.difference-within-sameness--variation in architectural elements: scale, floor height, ceiling height, and lighting, variety in texture of finish materials, and the presence of soft elements (carpets, couches, and pillows)
.opportunities to create separate "places" for engaging in different activities (warm and cozy, hard and sterile, dark or light, noisy or quiet)
.prevents boredom and discomfort by enabling children to seek out stimulation according to their changing moods, important to their ***EMOTIONAL*** development



Day, 2007

The task of designing a child care center demands an understanding of how children develop and what they need. A child's relationship to the built environment is unlike an adult's, and close attention is to be paid in how the design of their surroundings influence their well being. As a result of the investigation of children's perceptions of their built surroundings, a more sensitive understanding of children's spatial culture emerged. Catering to children's environmental needs of movement, comfort, competence and control, the design should have a positive influence on their social, physical, cognitive, and emotional development. Instead of 'placing' the children in an environment, a place shall be created 'for' them.

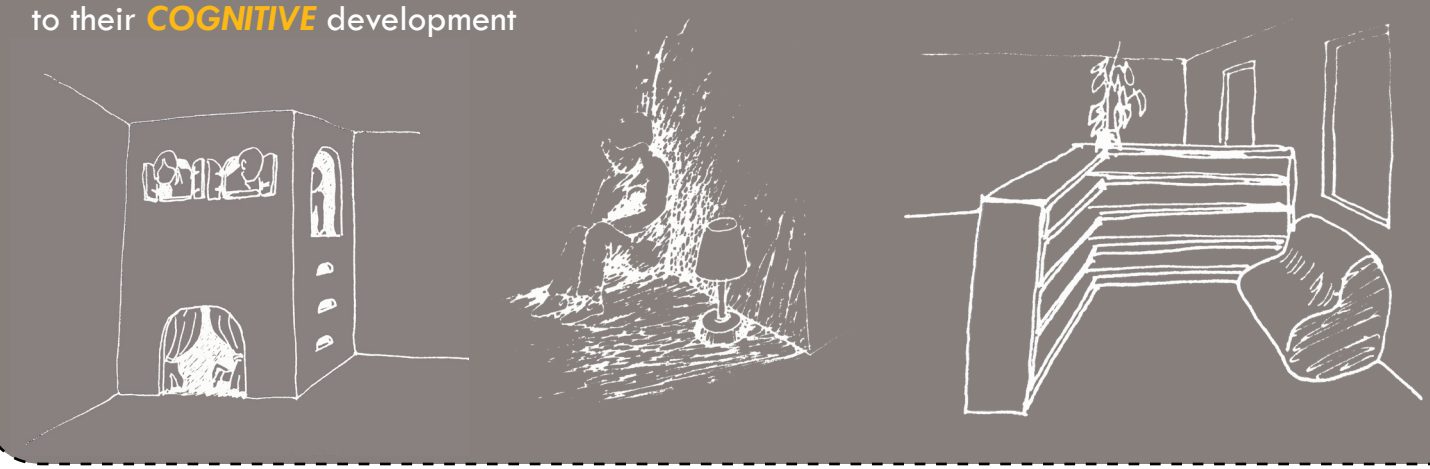
competence

.supportive environment that helps children fulfill their own needs, execute tasks easily, manage their own materials, and control their own movement from place to place

.variety of things to do--allows children to find things at which they can succeed

.variety of places--reduces overall scale of room and helps children perceive possibilities and limits of each activity

.well-organized/accessible things and places--invites child use, helps focus attention, important to their ***COGNITIVE*** development



control

.environment determines how children meet and how easily they can do things together, affecting their ***social*** development

.privacy: window seats, platforms, cubbyholes, fiberboard barrels with cutouts, and small enclosures (maintain balance between access to child and the child's privacy)

.predictability: unpredictable environments increase a child's lack of ease and control (doors and windows are informative, making the center "decipherable" by the child)

.orientation: views provide ***PHYSICAL*** and ***EMOTIONAL*** healing benefits, as well as ***COGNITIVE*** benefits by increasing their knowledge of the natural world; children need to sit so their backs are against the walls to experience a sense of environmental safety and control

security ⟷ exploration / adventure ⟷ independence

childhood: a journey of evolving needs

Day, 2007


children's environmental needs
movement
movement is essential to be the foundation for COGNITIVE development
large muscle activity promotes PHYSICAL development
indoor: supports for large muscle activity (climbers, rails, platforms, ramp, ladders, bouncy surfaces, movement areas, and sculptures with movable parts)
outdoor: supports for large muscle activity (climbers, rails, platforms, ramp, ladders, bouncy surfaces, movement areas, and sculptures with movable parts)
creative movement: dance, music, and sculpture activities
creates the tension between children's need to move and caregiver's needs to organize the movement
comfort
medium level of stimulation avoids feelings of comfort
differences within environment, variation in architectural elements: walls, floor heights, ceiling heights, and lighting, variety in texture of finish materials, and the presence of soft elements
provides a variety of sensory experiences
opportunities to create separate "places" for engaging in different activities (warm and cozy, hard and tactile, dark or light, noisy or quiet)
prevents boredom and disorientation by enabling children to seek out stimulation according to their developing needs, tempraments
comfort
zone
stimulation
competence
environment must allow children fulfill their own needs, operate tools easily, manage their own materials, and control their own movement from place to place
variety of things to do, allows children to find things at which they can succeed
variety of places, indoor scale and scale of room and large children perceive possibilities and small children feel safe
well-organized, accessible things and places, invites child use, helps have attention, important in their COGNITIVE development
control
environment determines how children fulfill their own needs, operate tools easily, manage their own materials, and control their own movement from place to place
primary: window seats, platforms, cubicles/niches, thresholds/ barrels with nature, and small enclosures (dormer/alcoves between rooms to child scale) and small enclosures
secondary: movable furniture, movable partitions, and movable child scale storage and control (doors and windows are interesting, making the center, "transformable" by the child)
orientation: views provide PHYSICAL and EMOTIONAL feeling benefits, as well as COGNITIVE benefits by increasing their knowledge of the natural world, children need to be up their backs and against the wall to experience a sense of environmental safety and control
security
exploration
adventure
independence
childhood: a journey of evolving needs
provides for
developmental skills
social
physical
cognitive
emotional
A child's development of social, physical, cognitive, and emotional skills is related to the dynamics of their relationship with their caregiver. The child's relationship with their caregiver is dependent on the environment, resulting directly from the design, in which the caregiver raises the child. Even though the relationship is vital, research shows that children remember more of the sights and sensations for more than they remember people. Unlike adults, every detail matters, as they deeply affect children.
Children's environmental needs are a function of developmental skills, which are a function of the environment, which is a function of the design.

provides for

developmental skills

- social
- physical
- cognitive
- emotional

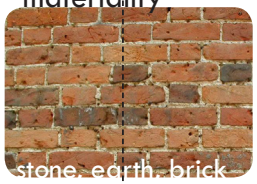
A child's development of social, physical, cognitive, and emotional skills is related to the closeness of their relationship with their caregiver. The quality of this relationship is dependent on the environment, resulting directly from the design, in which the caregiver raises the child. Even though the relationship is vital, research shows that children remember places and sensations far more than they remember people. (David, 1976) Unlike adults, every detail matters, as they deeply affect children.

multisensory learning

touch

.most critical sense until age 3
.texture, materiality, form, resistance

materiality

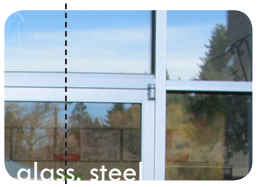


stone, earth, brick

.cold & hard visually
.texturally warm
.'old' associations, protectively enclosing, durable, rooted in place

wood

.touch-friendly, warm, attention-tolerant
.lighter and 'newer', but still rooted in place



glass, steel

.unfriendly--products of machines, not life
.feels 'new', open and expansive
.views and exposure

sight

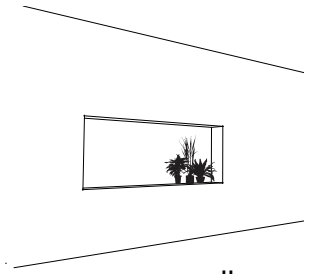
.visual design needs multisensory support
.light, color, shape, form

exciting, active

calming, quiet

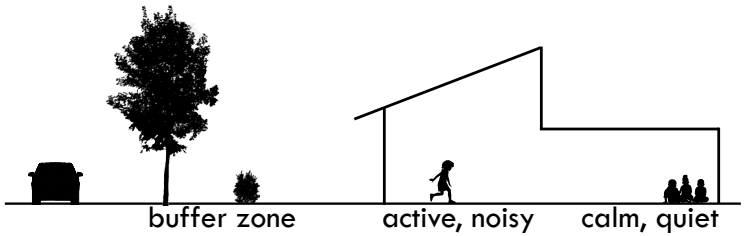
"They need - and seek - to experience things with their WHOLE bodies and through ALL their senses."
-Christopher Day, Environment and Children

smell
.conveys info of how we relate to things
.building and furnishing materials, plants



smellscape

hearing
.balance takes place in the ear
.object density, materiality



taste
.lines, shapes, textures, and materials provide imagery to our taste buds

Gherkin

Casa Battlo

Jewish Museum

analysis

adaptive re-use

case study 1 [UNL Children's Center]

site/size/ages

.adaptive re-use of Whittier Junior High School
.13,000 square feet
.150 children
.6 weeks-5 years

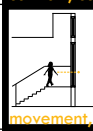
building

center separated into 3 families, each consisting of an infant, toddler, and preschool room

children stay in their family as they move up in the center, allows for smooth transitions

comfort, control

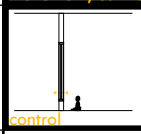
classroom



varied floor height creates loft for views and storage

movement, comfort, control

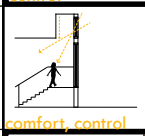
circulation



big, low windows into hallway assists with orientation and predictability

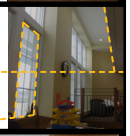
control

lighting



ceiling lowered to reduce scale

natural light floods interior



comfort, control

color/materials

natural wall colors and furniture

variety of "places with a variety of things to do

comfort, competence

outdoor play

water exploration encouraged

slide on hill is safer and less imposing

movement, competence

philosophy

Reggio Emilia, Creative Curriculum

.children are directly involved in the choices they have in the classroom
.children learn through hands on activities that have been purposely planned
.children stay in families (infant, toddler, and preschool rooms)
.outside time is key element
.Jean Piaget & Erik Erikson

summary

Designed by RDG as part of the renovation of Whittier Junior High, the building was revitalized with a new program that gave the abandoned building a new use.
.movement: indoor and outdoor play areas provide opportunities to run, climb, and slide
.comfort: varied ceiling and floor heights reduces scale
.competence: variety of things to do in a variety of places reduces overall scale
.control: large, low windows provide interior and exterior views, offering predicatability and orientation

case study 2 [Prairie Hill Learning Center]

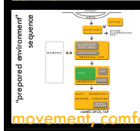
site/size/ages

.adaptive re-use of farmhouse and new construction of Renewable Energy Education Center
.3,700 square feet (size of new building only)
.75-80 children
.1 1/2 to 14 years (does not care for infants, although first years of a child's life are highly critical to his or her development)

building

comfort

classroom



variety of activities for children to choose from, located in a specific sequence

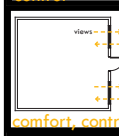
movement, comfort, control

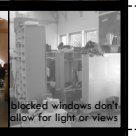
circulation

each room has direct access to outdoor play area

control

lighting





blocked windows don't allow for light or views

comfort, control

color/materials

self-teaching and self-correcting materials

concrete thinking

↓

abstract thinking

materials isolate specific learning tasks

natural materials

competence

outdoor play

sensory nature exploration

↓

environmental stewardship

movement, competence

philosophy

Montessori

.home-like & consistent atmosphere thoughout the day
.promotes individual growth as well as caring for others and the Earth
.situated in a farm-like environment that fosters respect for self, others, animals, and nature
."prepared environment": materials organized into 5 basic categories of practical life, sensorial, mathematics, language, and cultural subjects

summary

Designed by James Dyck of The Architectual Partnership, the school consists of a building for young children, a renovated farmhouse for the primary children, and a new Renewable Energy Education Center for the elementary children
.movement: opportunities for exploration in a farm-like environment
.comfort: opportunities to create separate "places" for different activities
.competence: child-initiated activities builds concentration; well-organized/accessible things and places; children involved in cooking, cleaning, etc.
.control: large, low windows provide interior and exterior views, offering predicatability and orientation

stand-alone

case study 3 [Knowledge Beginnings]

site/size/ages

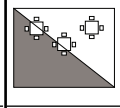
.corporate-owned
.170 children
.6 weeks-10 years

building

building built into the ground reduces the scale of the entrance

comfort

classroom



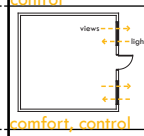
arbitrary tile/carpet layout reduces **comfort** and **competence**

circulation

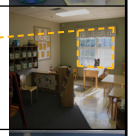
each room has direct access to outdoor play area

control

lighting

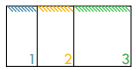


large, low windows provide natural light and views outside



comfort, control

color/materials



orientation assisted with one colored wall in each room

control

outdoor play

no physical **movement** encouraged

philosophy

NAEYC Accreditation, Thematic

.Accreditation: Early Learning as LEED: Architecture (helpful rating system but time-consuming and often misses the bigger picture)
.research-based educational programs

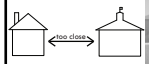
summary

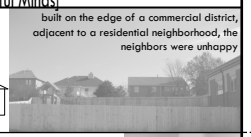
The lack of space in the crowded rooms take away from a child's emotional development, due to the inability of a child being able to spend some time apart from others.
.movement: no indoor play area and outdoor play area does not encourage movement
.comfort: scaled entrance, but crowded rooms do not allow for separate "places" to do a variety of activities
.competence: reading area helps focus attention
.control: orientation assisted with views to the outside as well as one different colored wall in each room

case study 4 [Colorful Minds]

site/size/ages

.individually-owned
.100 children
.6 weeks-10 years

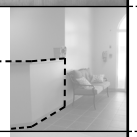




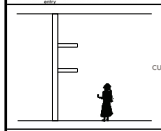
built on the edge of a commercial district, adjacent to a residential neighborhood, the neighbors were unhappy

building

unscaled, unoccupied reception desk reduces **comfort** and **control**

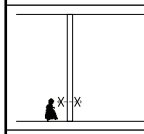


classroom



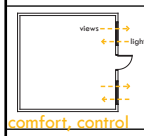
unreachable cubbies do not provide for **competence**

circulation



no windows from hallway into the classrooms restrict **control**

lighting

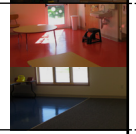


large, low windows provide natural light and views outside

comfort, control

color/materials

orientation assisted with distinct floor colors in each room



control

outdoor play

no outdoor play area at this time, no physical **movement** encouraged

philosophy

unknown, NAEYC member

.incorporates Nebraska's Early Learning Guidelines (minimum standards?)
.social & emotional development, approaches to learning, health & physical development, language & literacy development, mathematics, science, creative arts

summary

The design of Colorful Minds is not scaled down to the size of a child.
.movement: no indoor or outdoor play area
.comfort: no variation in scale, ceiling or flooring height, lighting, texture of finish materials, or soft elements
.competence: unreachable cubbies and high bathroom sinks do not allow children to execute talks on their own
.control: orientation assisted with views to the outside as well as different colored floors in each room; interior predictability is impossible with no windows into the hallway

adaptive re-use

PROS	CONS
.sustainable, resourceful, adaptive, and innovative .gives use to a vacant/abandoned building, enabling revitalization .exhibits how something better can be created from a degenerating condition .exposure to children at a young age helps their understanding of sustainable methods	.removal of asbestos, lead paint, etc. can be difficult .exterior structure restricts design

stand-alone

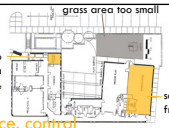
PROS	CONS
.freedom to design without restrictions .no existing conditions to design around	.costly .uniformity and flawlessness make it difficult to give contemporary buildings the quality of spirit native to many older buildings

precedents
what has been done?

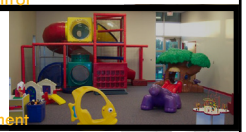
addition

case study 5 [Ivy League Child Development Center]

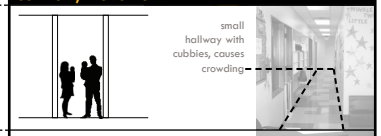
.addition to an existing insurance company
.84 children
.6 weeks-10 years



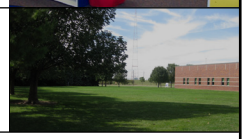
competence, control



comfort, movement



competence



movement

Thematic

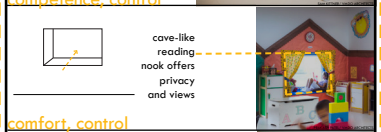
.learning centers designed for children to learn through play and active involvement
.exploratory activities
.Jean Piaget

The Ivy League Child Development Center thrives on its connection to a business provides convenient child care to the adjacent employees.
.movement: indoor play area supports large muscle activity including running, climbing, and sliding; kitchen visible from indoor play area, view of cooking
.comfort: varied ceiling height in indoor play area
.competence: well-organized and accessible things invite child use and allows them to execute tasks easily
.control: limited views restrict orientation and predictability

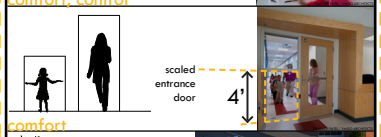
case study 6 [Manassas Park Pre-K]

.addition to an existing elementary school
.12,120 square feet
.70 children
.4-5 years

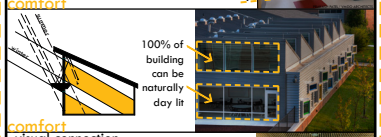
competence, control



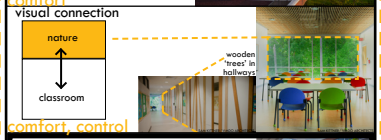
comfort, control



comfort



comfort



comfort, control

movement, comfort, control

unknown, state standards

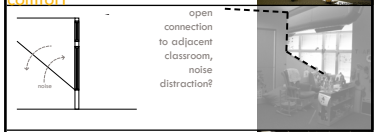
.Virginia's Foundation Blocks for Learning
.comprehensive standards for 4-year-olds: literacy, mathematics, science, history & social sciences, physical and motor development, and personal & social development
.creates a 'school in the woods' with strong relationship with adjacent mixed-oak forest & draws from recreational opportunities

VMDO's design of Manassas Park Pre-K brings nature inside. Learning about their environment will increase the children's social and environmental awareness.
.movement: outdoor classroom allows large muscle activity
.comfort: door and floor variations in scale; interior flooded with natural light and visual/direct connections with nature
.competence: hallway breakout space and reading nook offer variety of places to do different things
.control: reading nook offers privacy and orientation, with views out to nature

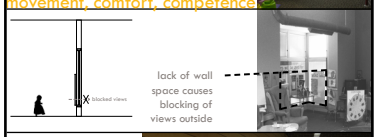
case study 7 [Kellom Educare]

.connected to an existing elementary school
.30,600 square feet
.183 children
.6 weeks-5 years

comfort



movement, comfort, competence



comfort

movement, comfort

Reggio Emilia, Educare

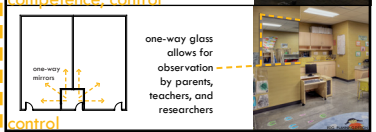
.serves low-income families, Susan Buffett Foundation
.community outreach programs and educational facilities combine to give parents and educators valuable resources
.research-based practices and strategies
."continuity of care": promotes secure teacher-child attachment

Designed by RDG, the first Educare center built in Omaha connects to Kellom Elementary School.
.movement: outdoor play area supports large muscle activity including riding, climbing, and sliding; indoor play area available in the hallways (difficult to supervise?)
.comfort: varied ceiling and floor heights reduce scale, interior flooded with natural light
.competence: variety of places to do different things
.control: limited views outside due to lack of wall space restricts orientation and predictability

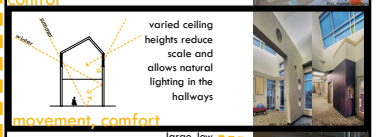
case study 8 [Indian Hills Educare]

.connected to an existing elementary school
.200 children
.6 weeks-5 years

competence, control

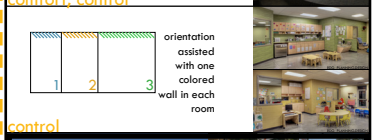


control

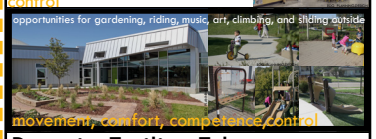


movement, comfort

comfort, control



control



movement, comfort, competence, control

Reggio Emilia, Educare

.serves low-income families, Susan Buffett Foundation
.community outreach programs and educational facilities combine to give parents and educators valuable resources
.research-based practices and strategies
."continuity of care": promotes secure teacher-child attachment

Also designed by RDG, the second Educare facility in Omaha connects to Indian Hills Elementary school.
.movement: outdoor play area supports large muscle activity including riding, climbing, and sliding; indoor play area available in the hallways (difficult to supervise?)
.comfort: varied ceiling and floor heights reduce scale, interior flooded with natural light
.competence: variety of places to do different things
.control: orientation assisted with colored walls in each room

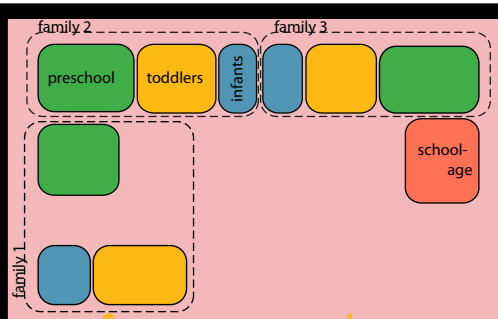
addition

PROS	CONS
.on-site child care is convenient for parents .company benefits from child care availability .support from existing business or school	.exterior design may be restricted to blend with existing

site/size/ages

.adaptive re-use of Whittier Junior High School
.13,000 square feet
.150 children
.6 weeks-5 years

building

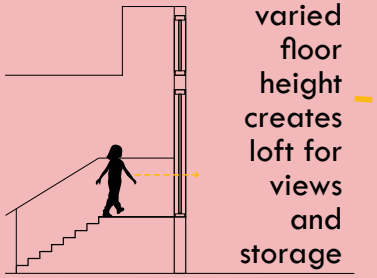


center separated into 3 families, each consisting of an infant, toddler, and preschool room

children stay in their family as they move up in the center, allows for smooth transitions

comfort, control

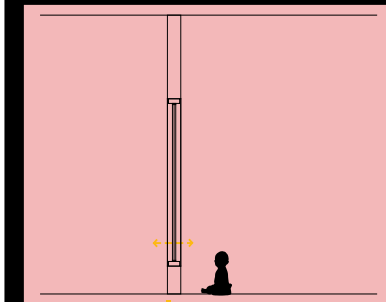
classroom



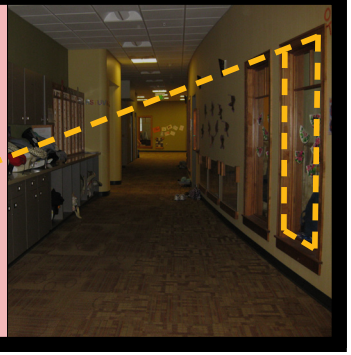
varied floor height creates loft for views and storage

movement, comfort, control

circulation

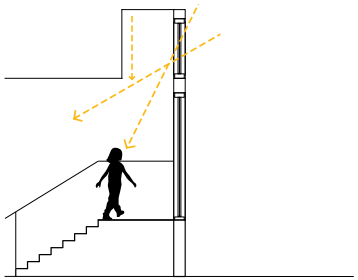


big, low windows into hallway assists with orientation and predictability



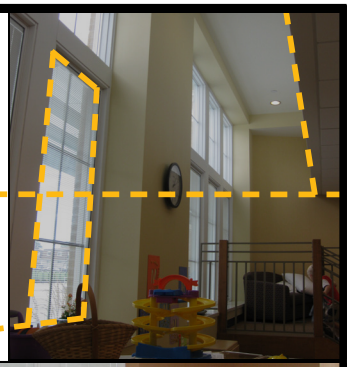
control

lighting



ceiling lowered to reduce scale

natural light floods interior



comfort, control

color/materials

natural wall colors and furniture

variety of "places with a variety of things to do

comfort, competence

outdoor play

water exploration encouraged

slide on hill is safer and less imposing

movement, competence

philosophy

Reggio Emilia, Creative Curriculum

.children are directly involved in the choices they have in the classroom
.children learn through hands on activities that have been purposely planned
.children stay in families (infant, toddler, and preschool rooms)
.outside time is key element
.Jean Piaget & Erik Erikson

adaptive re-use

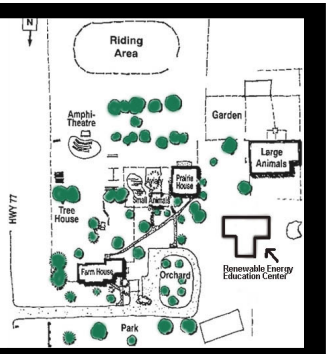
case study 1 [UNL Children's Center]

Designed by RDG as part of the renovation of Whittier Junior High, the building was revitalized with a new program that gave the abandoned building a new use.

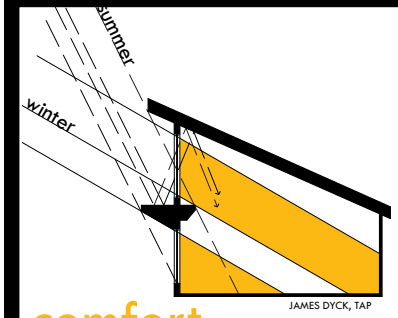
.**movement**: indoor and outdoor play areas provide opportunities to run, climb, and slide
.**comfort**: varied ceiling and floor heights reduces scale
.**competence**: variety of things to do in a variety of places reduces overall scale
.**control**: large, low windows provide interior and exterior views, offering predictability and orientation

site/size/ages

.adaptive re-use of farmhouse and new construction of Renewable Energy Education Center
.3,700 square feet (size of new building only)
.75-80 children
.1 1/2 to 14 years (does not care for infants, although first years of a child's life are highly critical to his or her development)



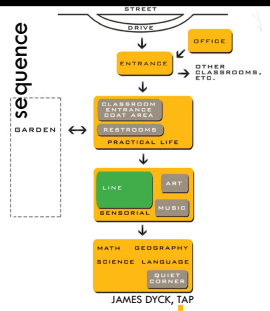
building



comfort

classroom

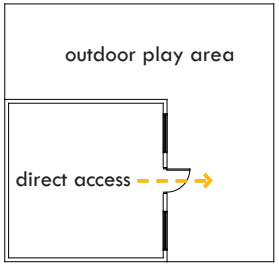
"prepared environment" sequence



variety of activities for children to choose from, located in a specific sequence

movement, comfort, control

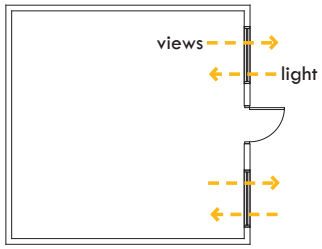
circulation



each room has direct access to outdoor play area

control

lighting



comfort, control

blocked windows don't allow for light or views

color/materials

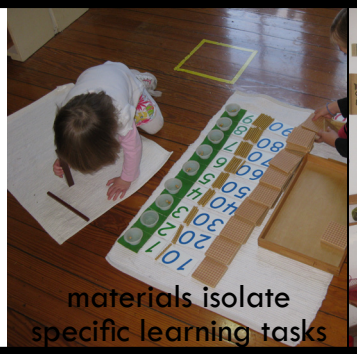
self-teaching and self-correcting materials

concrete thinking

↓

abstract thinking

competence



materials isolate specific learning tasks

natural materials

outdoor play

sensory nature exploration

↓

environmental stewardship

movement, competence

philosophy

Montessori

.home-like & consistent atmosphere throughout the day
.promotes individual growth as well as caring for others and the Earth
.situated in a farm-like environment that fosters respect for self, others, animals, and nature
."prepared environment": materials organized into 5 basic categories of practical life, sensorial, mathematics, language, and cultural subjects

adaptive re-use

case study 2 [Prairie Hill Learning Center]

Designed by James Dyck of The Architectural Partnership, the school consists of a building for young children, a renovated farmhouse for the primary children, and a new Renewable Energy Education Center for the elementary children

.**movement**: opportunities for exploration in a farm-like environment

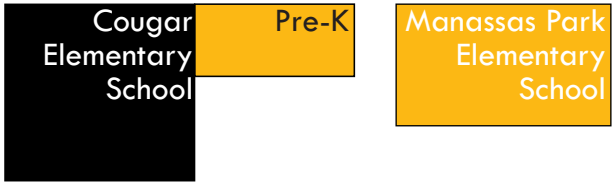
.**comfort**: opportunities to create separate "places" for different activities

.**competence**: child-initiated activities builds concentration; well-organized/accessible things and places; children involved in cooking, cleaning, etc.

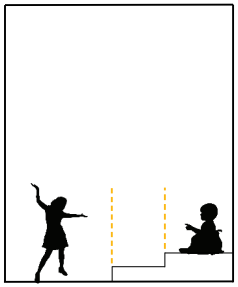
.**control**: large, low windows provide interior and exterior views, offering predicatability and orientation

site/size/ages

.addition to an existing elementary school
.12,120 square feet
.70 children
.4-5 years



building

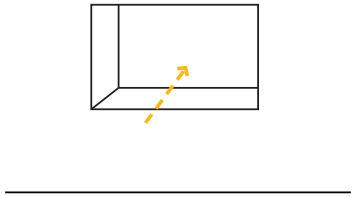


hallway breakout space creates separate places for activities


SAM KITTNER / VMDO ARCHITECTS

competence, control

classroom



cave-like reading nook offers privacy and views

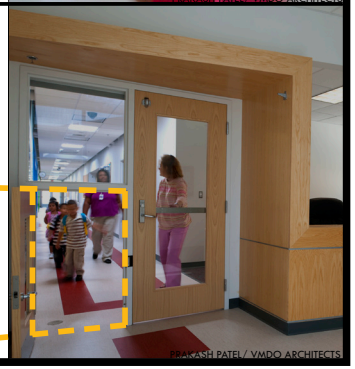

PRAKASH PATEL / VMDO ARCHITECTS

comfort, control

circulation

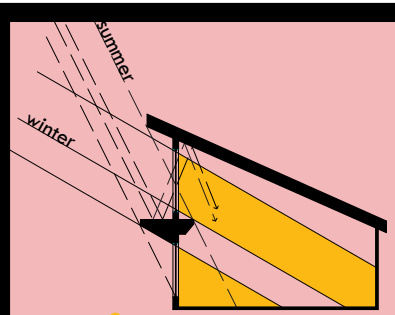
scaled entrance door

4'


PRAKASH PATEL / VMDO ARCHITECTS

comfort

lighting

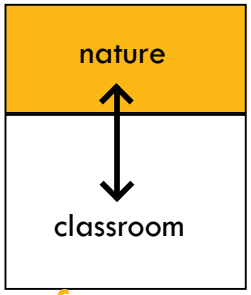


100% of building can be naturally day lit

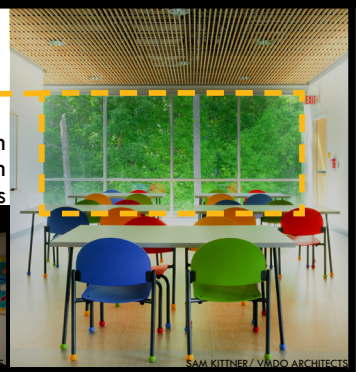
comfort

color/materials

visual connection

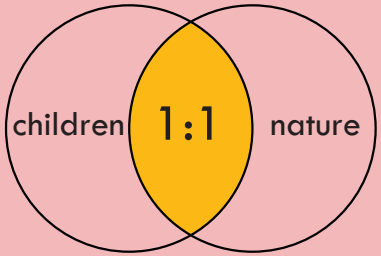


wooden 'trees' in hallways



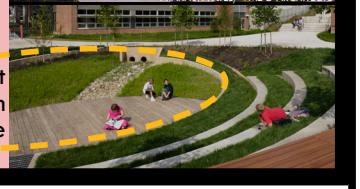
comfort, control

outdoor play



natural seating in social space

direct connection with nature



movement, comfort, control

philosophy

unknown, state standards

.Virginia's Foundation Blocks for Learning
.comprehensive standards for 4-year-olds: literacy, mathematics, science, history & social sciences, physical and motor development, and personal & social development
.creates a 'school in the woods' with strong relationship with adjacent mixed-oak forest & draws from recreational opportunities

addition

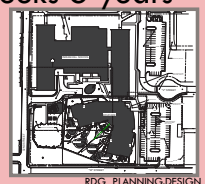
case study 3 [Manassas Park Pre-K]

VMDO's design of Manassas Park Pre-K brings nature inside. Learning about their environment will increase the children's social and environmental awareness.

.movement: outdoor classroom allows large muscle activity
.comfort: door and floor variations in scale; interior flooded with natural light and visual/direct connections with nature
.competence: hallway breakout space and reading nook offer variety of places to do different things
.control: reading nook offers privacy and orientation, with views out to nature

site/size/ages

.connected to an existing elementary school
.200 children
.6 weeks-5 years

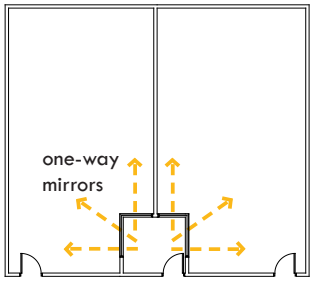


building

administration area includes community outreach programs and educational facilities to give parents and educators valuable resources

competence, control

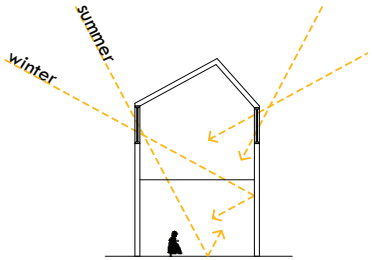
classroom



one-way glass allows for observation by parents, teachers, and researchers

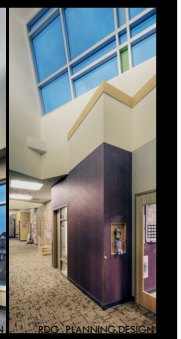
control

circulation

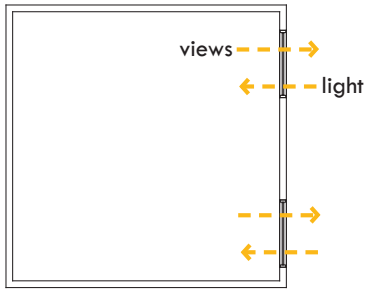


varied ceiling heights reduce scale and allows natural lighting in the hallways

movement, comfort



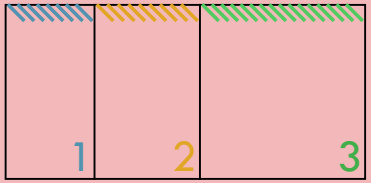
lighting



large, low windows provide natural light and views outside, needs soft elements

comfort, control

color/materials



orientation assisted with one colored wall in each room

control

outdoor play

opportunities for gardening, riding, music, art, climbing, and sliding outside

movement, comfort, competence, control

philosophy

Reggio Emilia, Educare

.serves low-income families, Susan Buffett Foundation
.community outreach programs and educational facilities combine to give parents and educators valuable resources
.research-based practices and strategies
.“continuity of care”: promotes secure teacher-child attachment

addition

case study 4 [Indian Hills Educare]

Designed by RDG, the second Educare facility in Omaha connects to Indian Hills Elementary school.

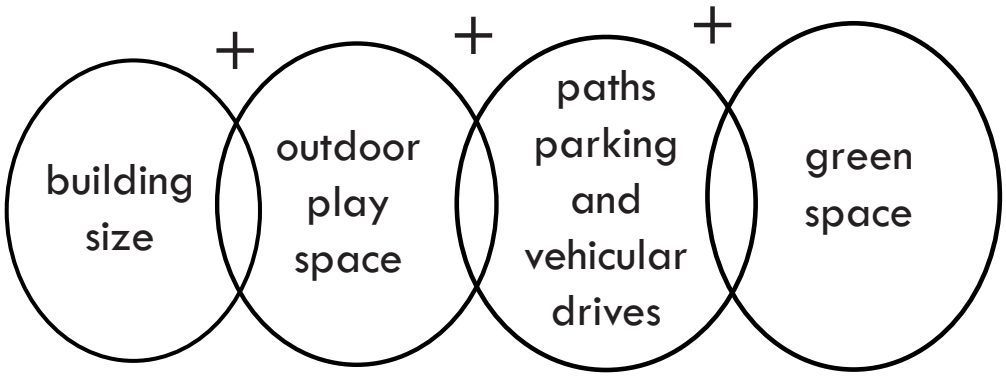
.**movement**: outdoor play area supports large muscle activity including riding, climbing, and sliding; indoor play area available in the hallways (difficult to supervise?)

.**comfort**: varied ceiling and floor heights reduce scale, interior flooded with natural light

.**competence**: variety of places to do different things

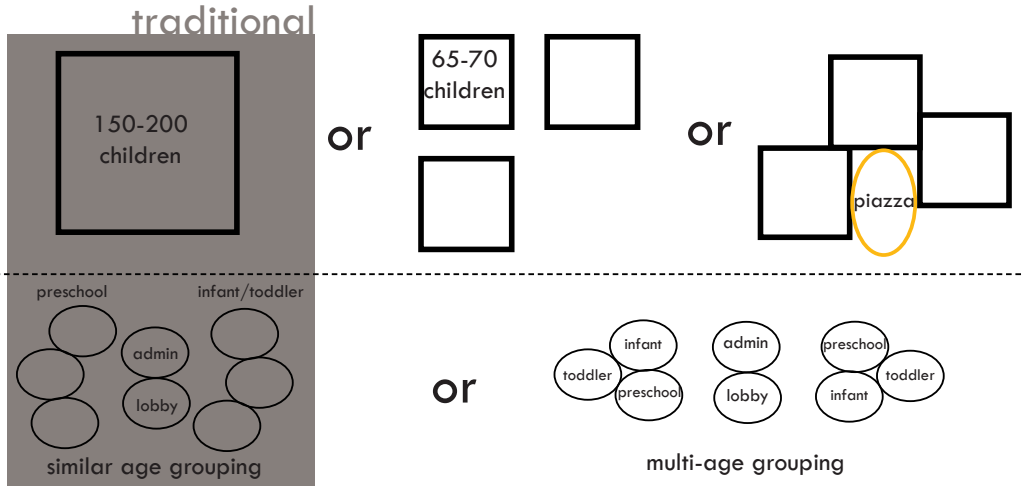
.**control**: orientation assisted with colored walls in each room

site/size/ages



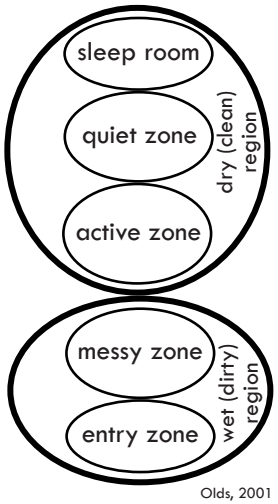
Olds, 2001

building

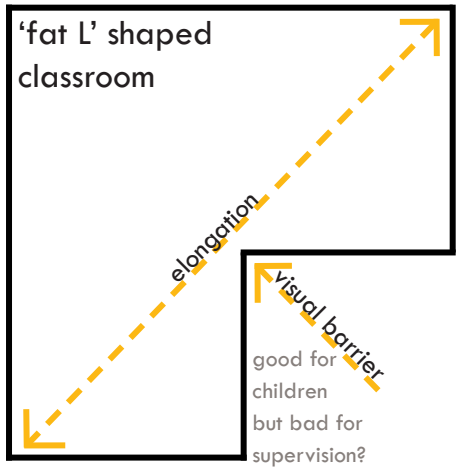


design analysis

classroom



Olds, 2001



Dyck, 1994

amount of percieved space

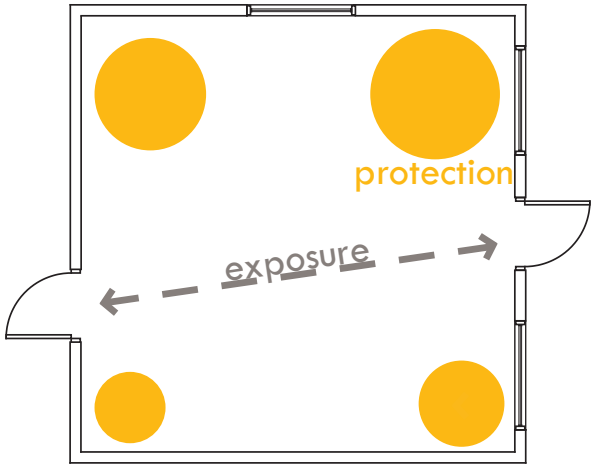
↓

perception of others in the space

↓

sense of crowding

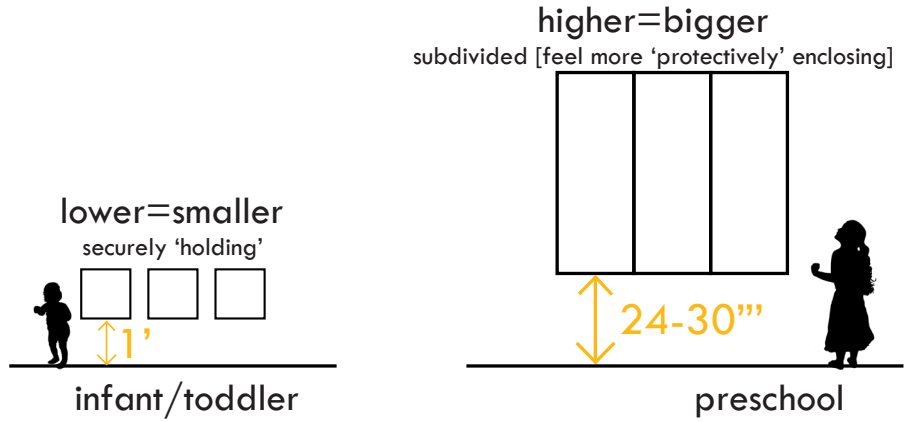
circulation



insecure, attention-distracting? or anticipatory, safety precaution?

lighting

Constantly varying light quality nourishes both eyes and light sensitive organs - essential for healthy child development. (Day, 2007)



color/materials

Prior to age 5 or 6, children are more likely to remember color than form. (Day, 2007)

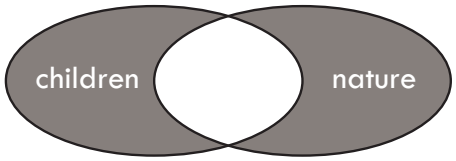
Until about 7 years of age, children experience their inner world at least as vividly as their material surroundings, 'inner colors - complementary after-images - often have stronger influence on mood.' (Olds, 2001)

outdoor play

Richard Louv has exposed evidence that children today are at risk for what he calls "Nature-Deficit Disorder," due to the lack of connection children have with nature. (Louv, 2008)

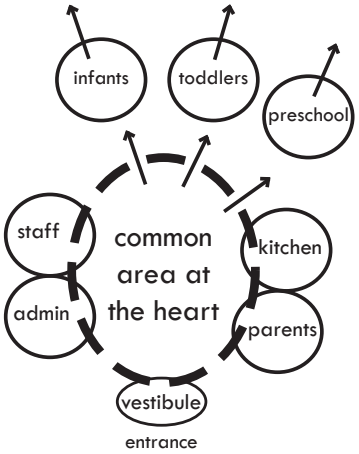
nature

- **.neural** processing
- **.emotional** outlet
- **.knowledge** about the world

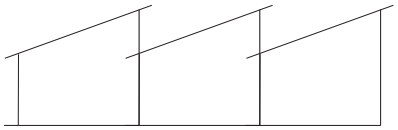


philosophy

Reggio Emilia



Montessori



each classroom expressed

site/size/ages

adaptive re-use

or

elementary school, business, or university

addition

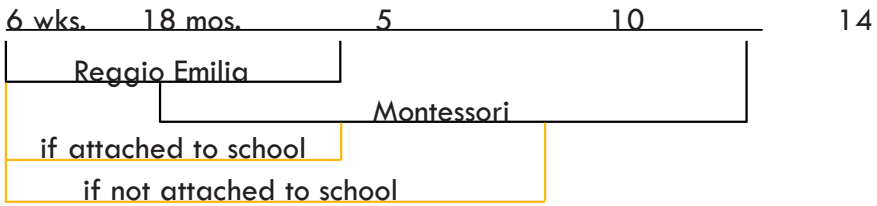
50 children

or

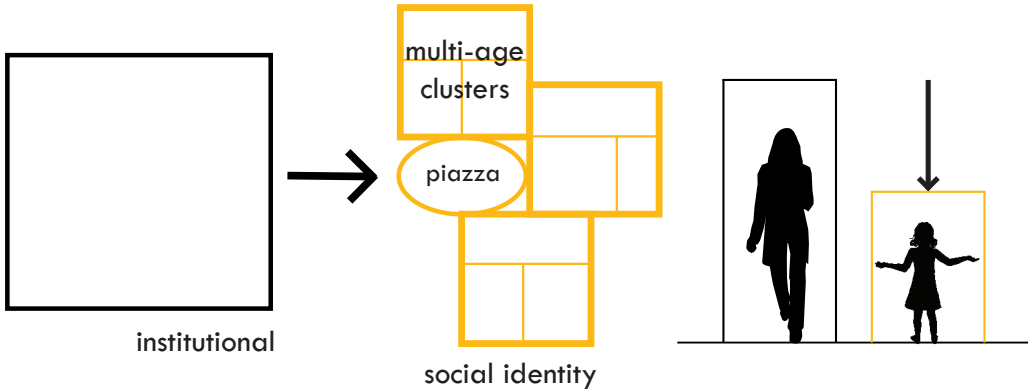
50 children

50 children

50 children



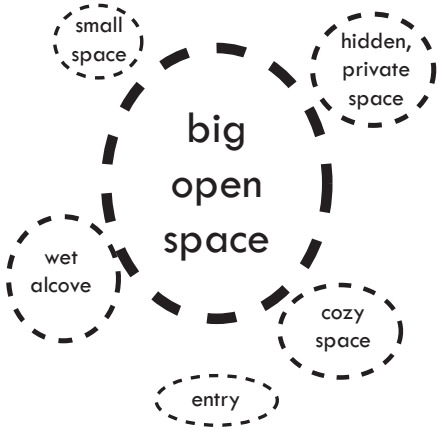
building



Constantly varying light quality nourishes both eyes and light sensitive organs - essential for healthy child development. (Day, 2007)

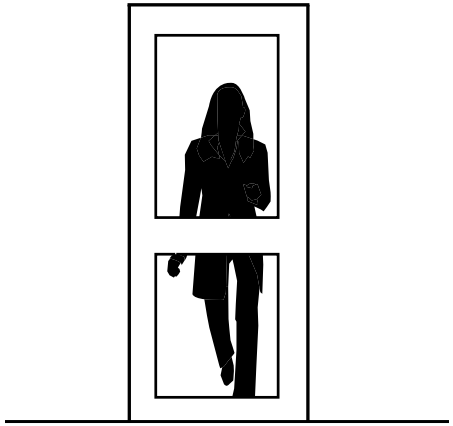
conclusions

classroom



Dull rooms increase dependence on *things*. As thing-dependence is hardly sustainable, it's better if rooms *themselves* stimulate imagination. Rooms specifically designed for this need very little in the way of consumerist 'props.' (Day, 2007)

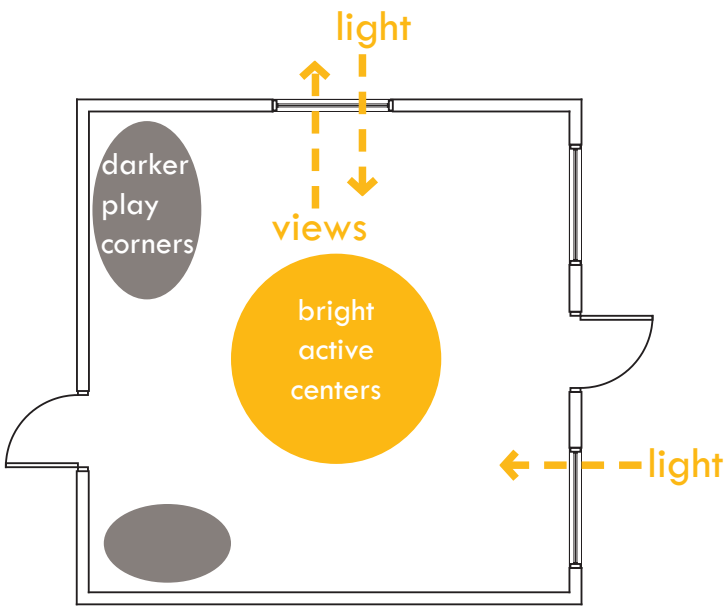
circulation



anticipatory, safety precaution

allows orientation and predictability

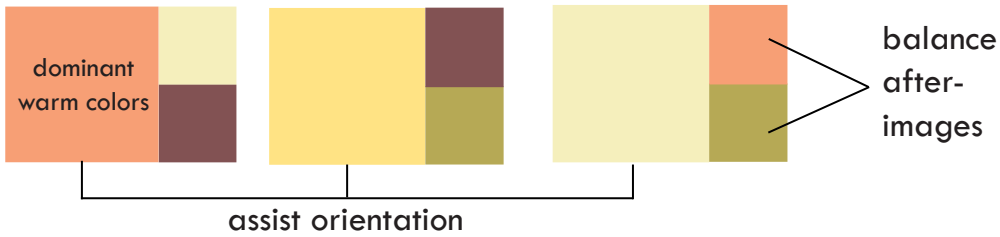
lighting



color/materials

.unified, but distinct color scheme for each room

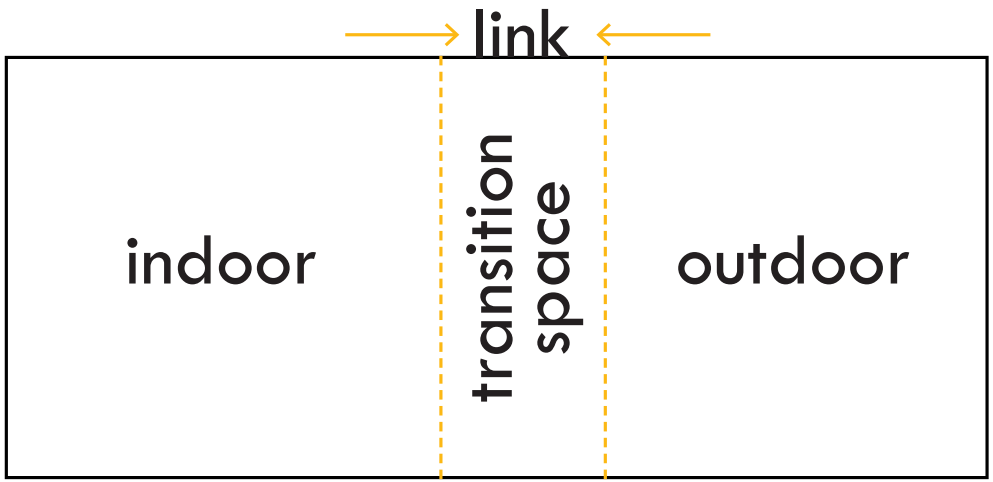
.use colors inspired from nature



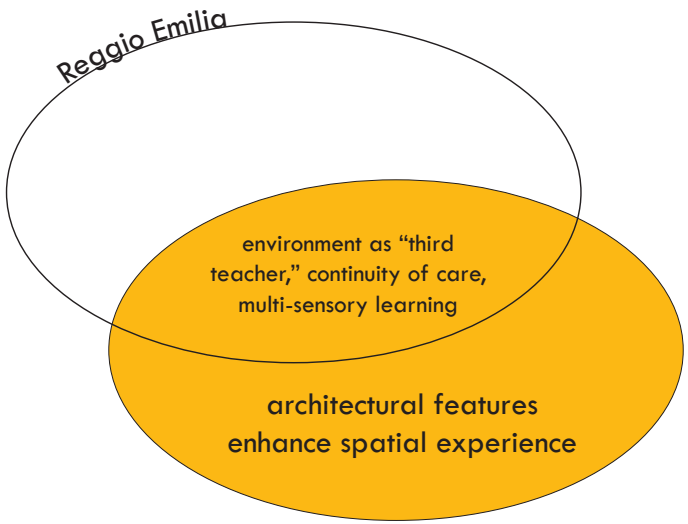
open-ended natural materials = imagination, creativity and symbolic (abstract) thinking

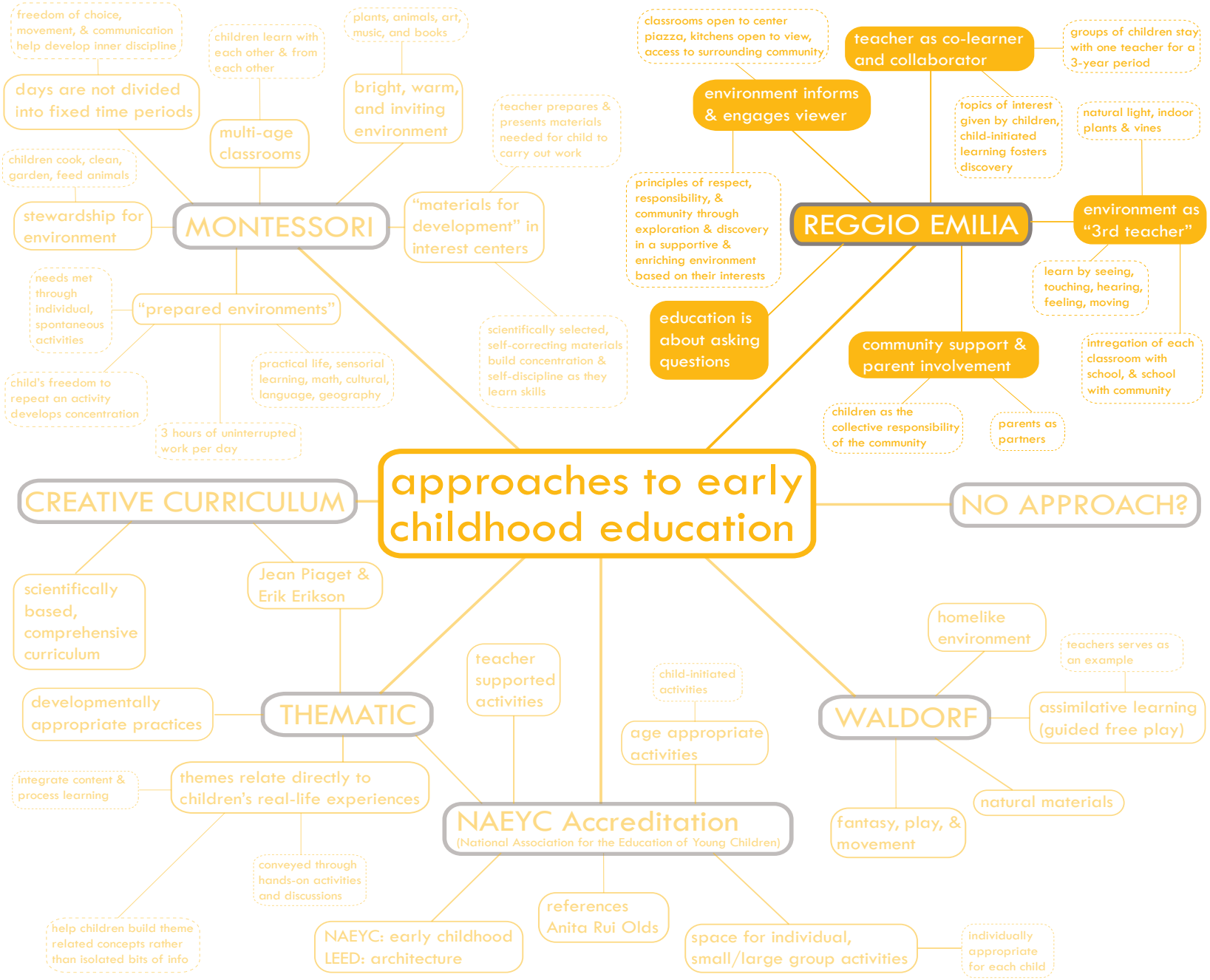
Arbor Day Foundation, 2010

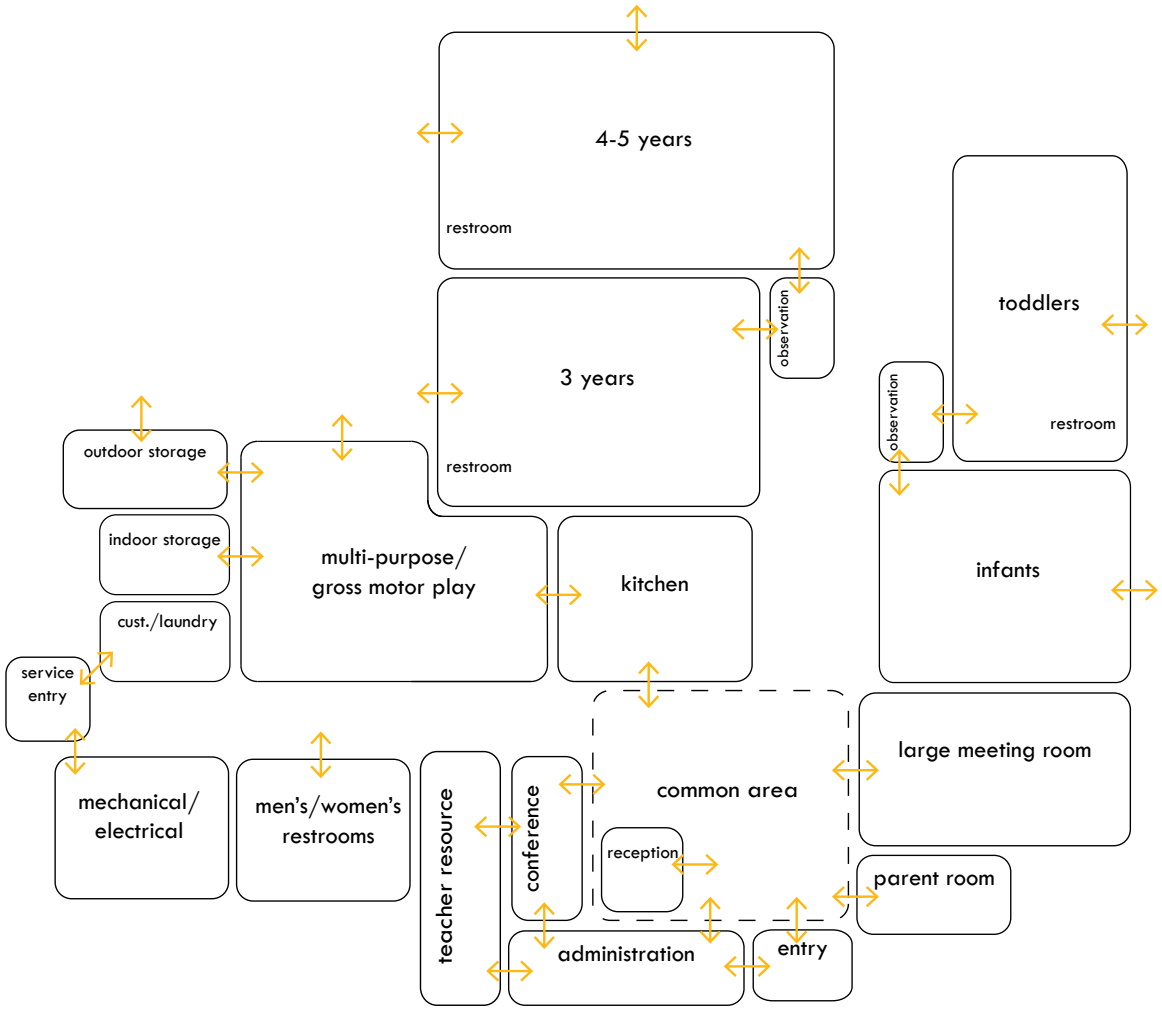
outdoor play

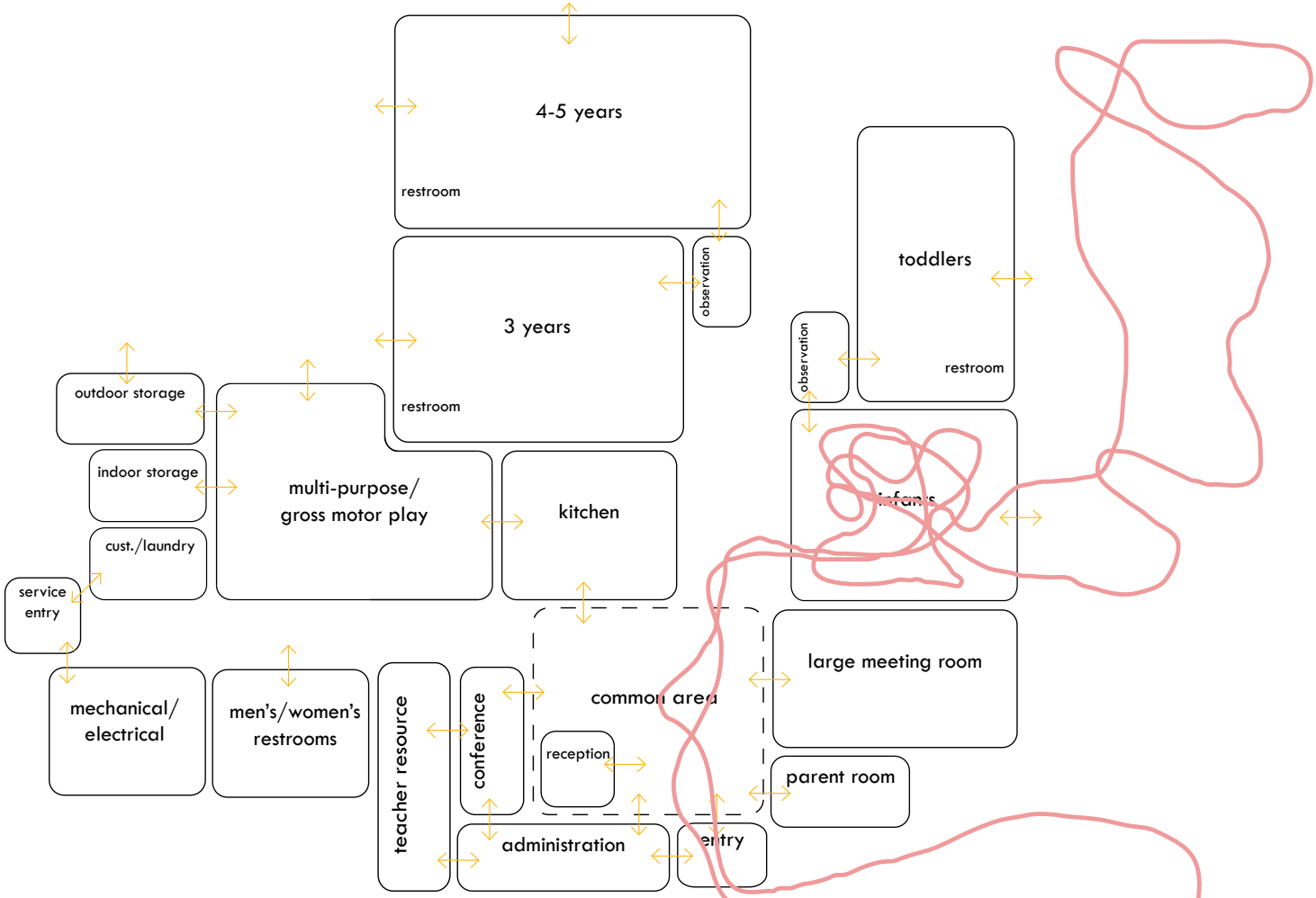


philosophy



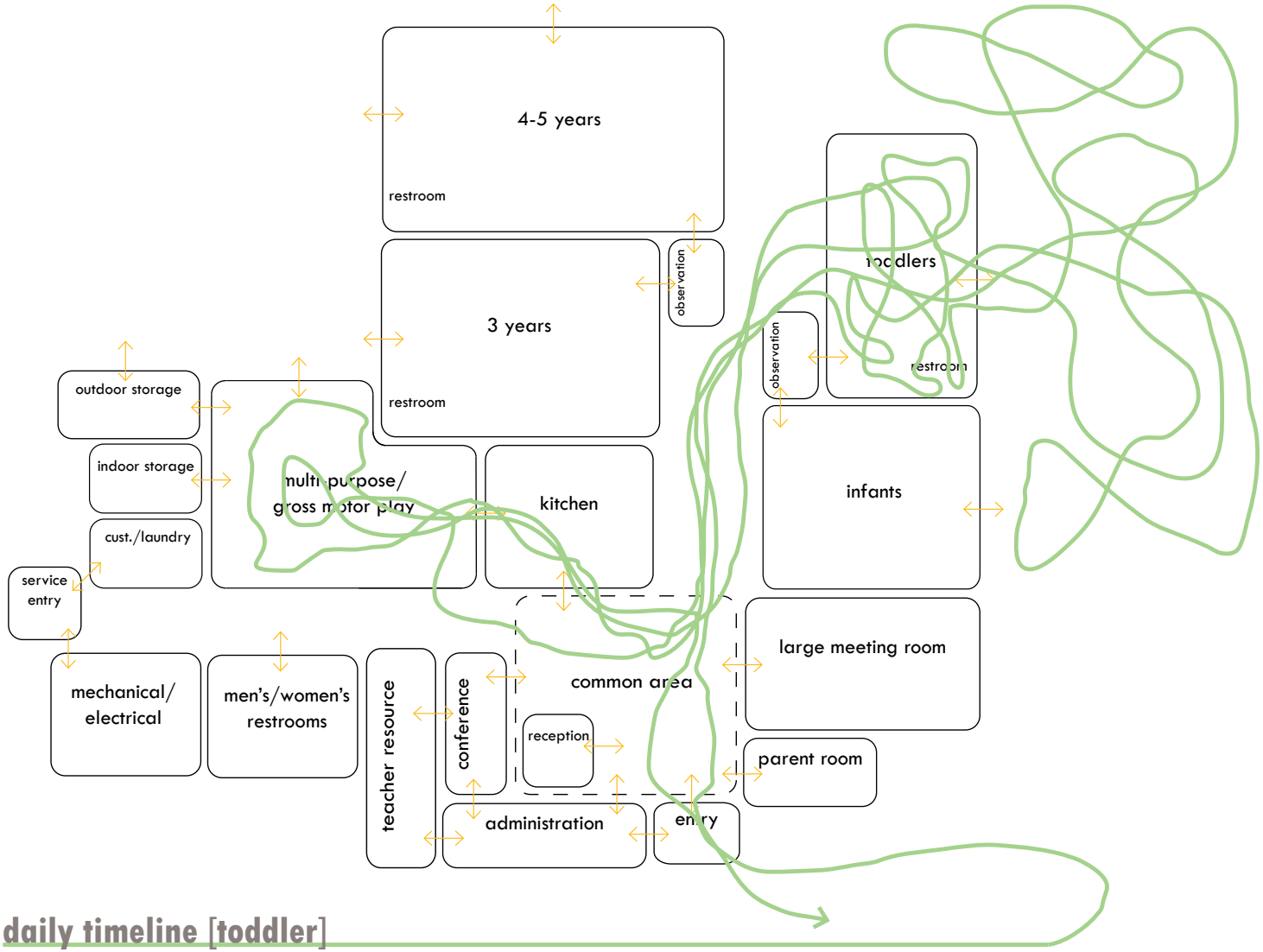

approaches to early childhood education
MONTESSORI
freedom of choice, movement, & communication help develop inner discipline
days are not divided into fixed time periods
children learn with each other & from each other
multi-age classrooms
plants, animals, art, music, and books
bright, warm, and inviting environment
children cook, clean, garden, feed animals
stewardship for environment
teacher prepares & presents materials needed for child to carry out work
"materials for development" in interest centers
needs met through individual, spontaneous activities
"prepared environments"
child's freedom to repeat an activity develops concentration
practical life, sensorial learning, math, cultural, language, geography
3 hours of uninterrupted work per day
scientifically selected, self-correcting materials build concentration & self-discipline as they learn skills
REGGIO EMILIA
classrooms open to center piazza, kitchens open to view, access to surrounding community
teacher as co-learner and collaborator
groups of children stay with one teacher for a 3-year period
environment informs & engages viewer
topics of interest given by children, child-initiated learning fosters discovery
natural light, indoor plants & vines
principles of respect, responsibility, & community through exploration & discovery in a supportive & enriching environment based on their interests
environment as "3rd teacher"
learn by seeing, touching, hearing, feeling, moving
education is about asking questions
community support & parent involvement
intregation of each classroom with school, & school with community
children as the collective responsibility of the community
parents as partners
CREATIVE CURRICULUM
scientifically based, comprehensive curriculum
Jean Piaget & Erik Erikson
NO APPROACH?
THEMATIC
developmentally appropriate practices
themes relate directly to children's real-life experiences
integrate content & process learning
conveyed through hands-on activities and discussions
help children build theme related concepts rather than isolated bits of info
NAEYC Accreditation
(National Association for the Education of Young Children)
teacher supported activities
child-initiated activities
age appropriate activities
NAEYC: early childhood
LEED: architecture
references Anita Rui Olds
space for individual, small/large group activities
individually appropriate for each child
WALDORF
homelike environment
teachers serves as an example
assimilative learning (guided free play)
natural materials
fantasy, play, & movement


4-5 years
restroom
3 years
restroom
observation
toddlers
restroom
observation
outdoor storage
indoor storage
cust./laundry
service entry
multi-purpose/ gross motor play
kitchen
infants
mechanical/ electrical
men's/women's restrooms
teacher resource
conference
common area
reception
large meeting room
parent room
administration
entry



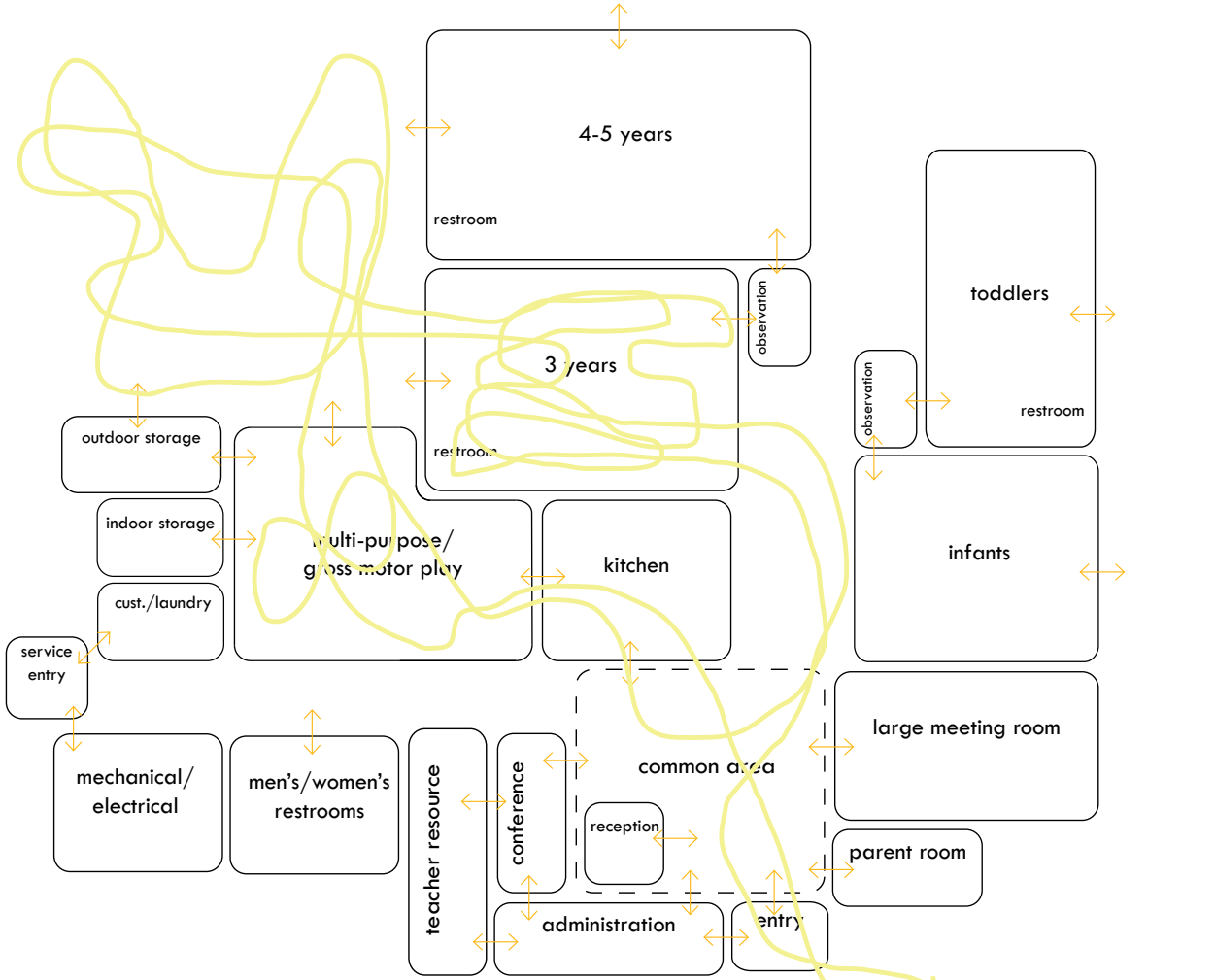
daily timeline [infant]

travel to
arrival
approach
entry
transition
breakfast
free play
diaper change
nap
outdoor play
small group activity
diaper change
lunch
diaper change
nap
diaper change
snack
outdoor play
free play
dismissal
departvure
travel from



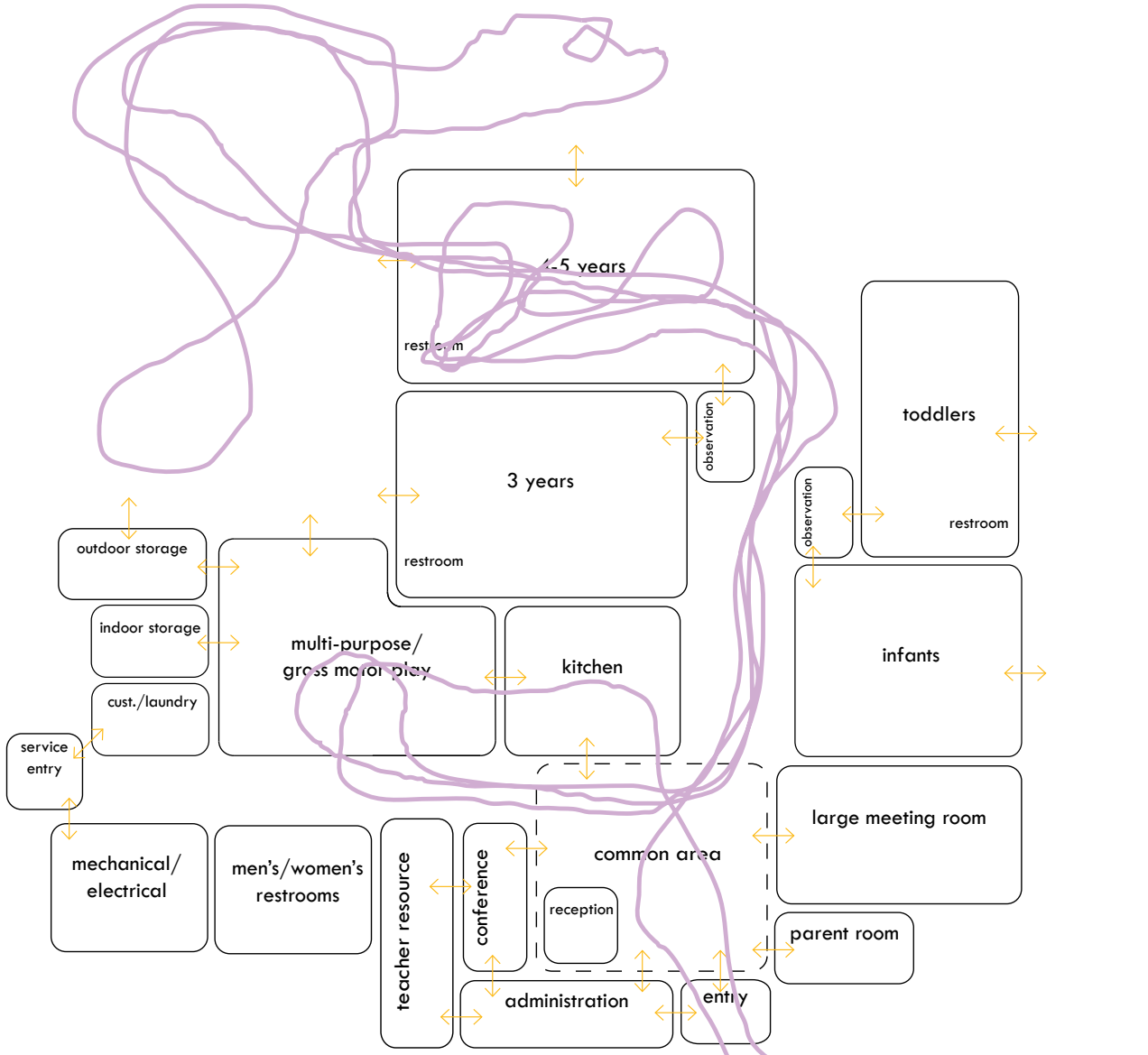
daily timeline [toddler]

travel to
arrival
approach
entry
transition
breakfast
classroom
individual activity
restroom
large group activity
outdoor play
small group activity
restroom
lunch
restroom
nap
restroom
snack
outdoor play
individual activity
small group activity
dismissal
departvure
travel from



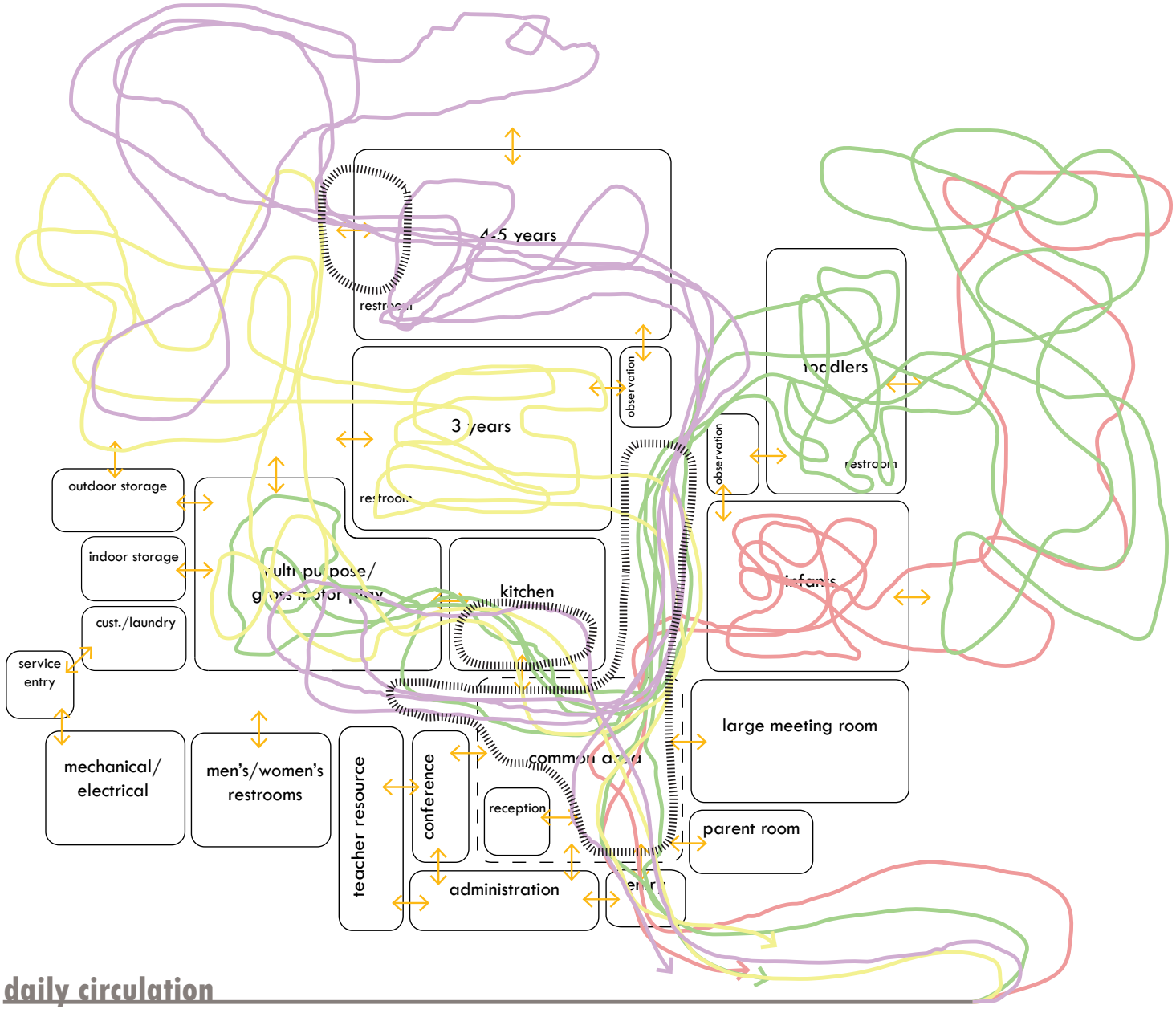
daily timeline [3-year-old]

travel to
arrival
approach
entry
transition
breakfast
classroom
individual activity
restroom
large group activity
outdoor play
small group activity
restroom
lunch
restroom
nap
restroom
snack
outdoor play
individual activity
small group activity
dismissal
departvure
travel from

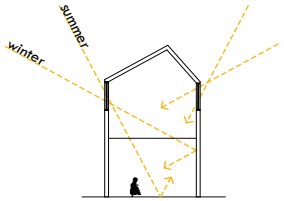


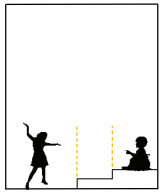
daily timeline [4-5-year-old]

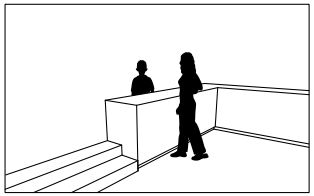
travel to
arrival
approach
entry
transition
breakfast
classroom
individual activity
restroom
large group activity
outdoor play
small group activity
restroom
lunch
restroom
nap
restroom
snack
outdoor play
individual activity
small group activity
dismissal
departvure
travel from

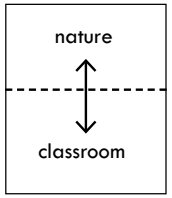


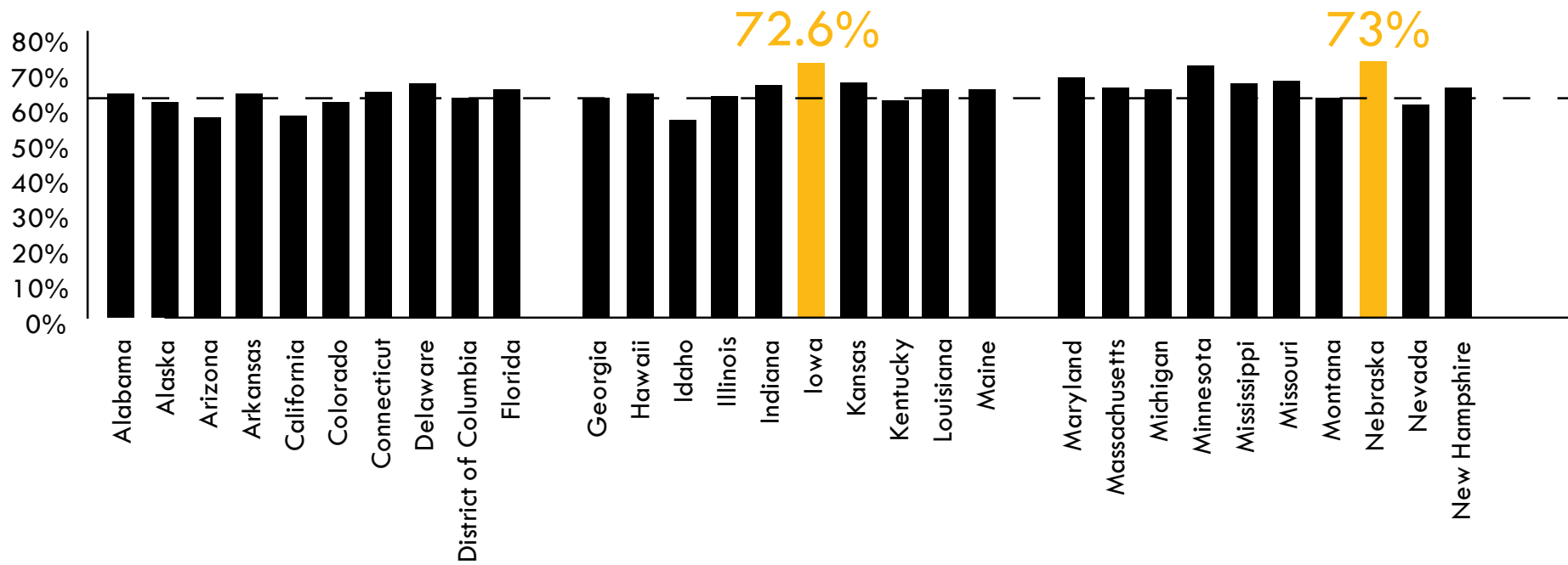
daily circulation



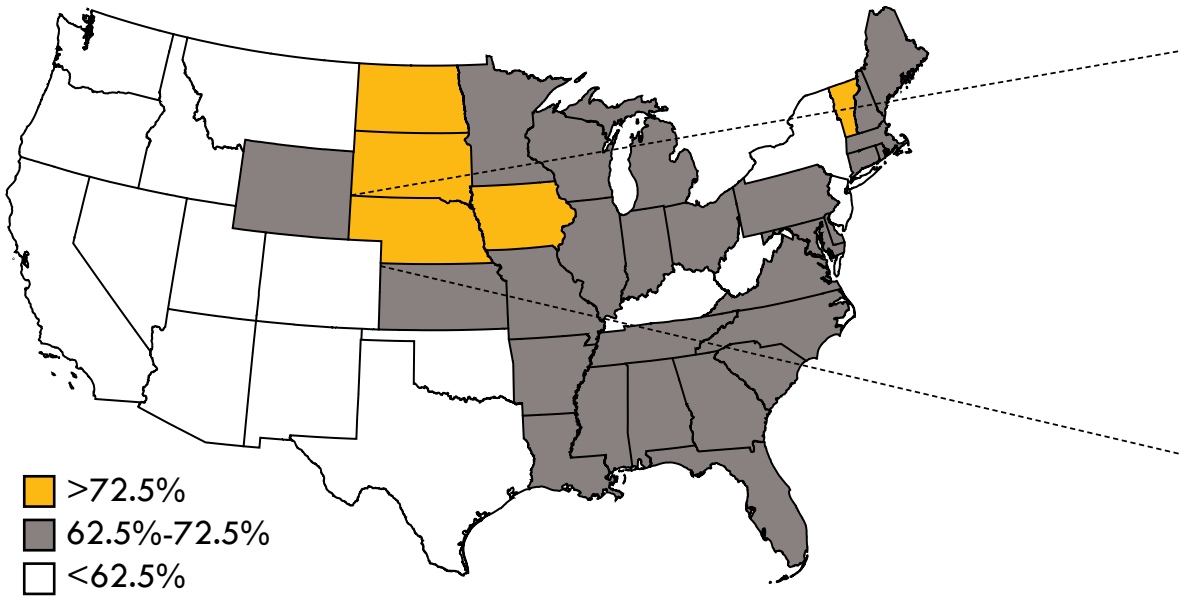


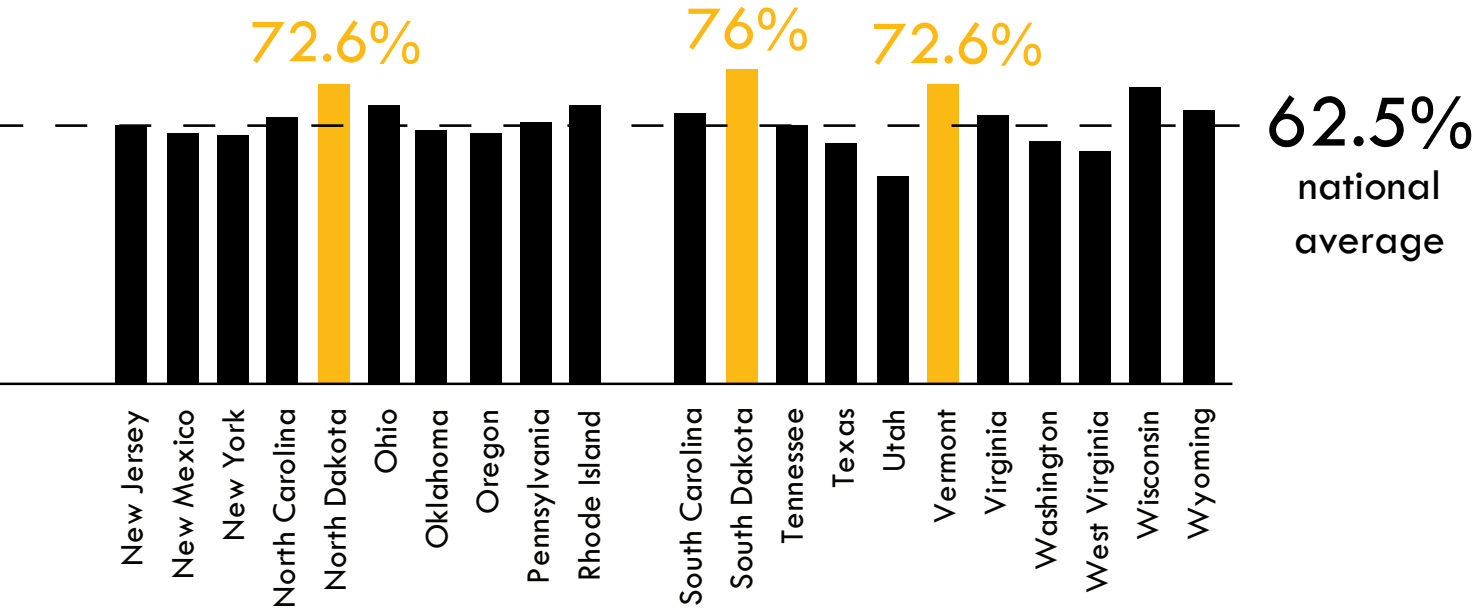






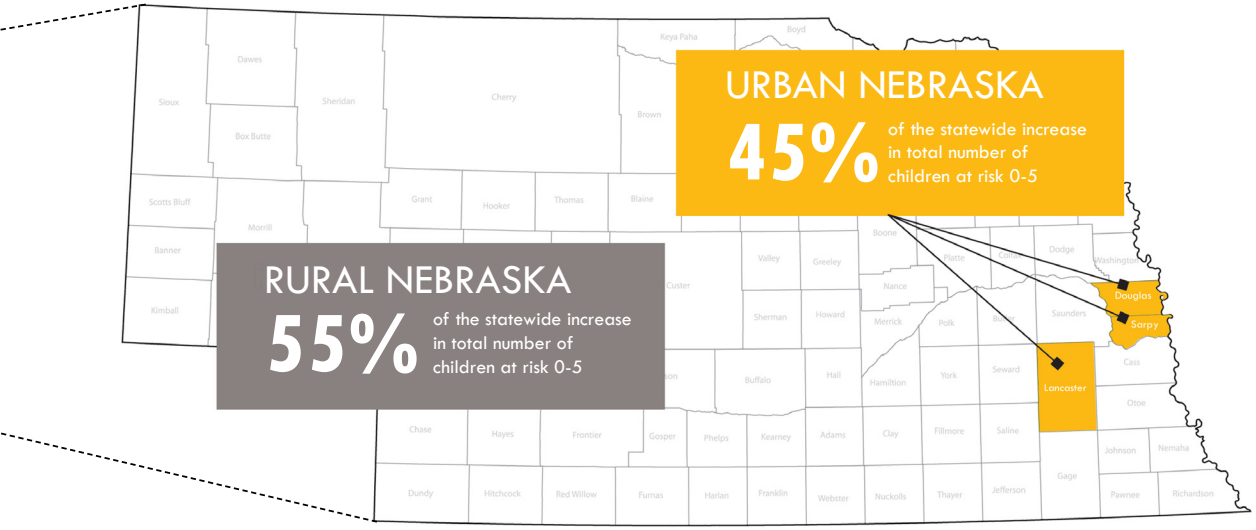
Adverse early environments are powerful predictors of adult failure. In Nebraska, more than 47,000 children aged 0-5 are at risk of failing in school and later in life. (Nebraska Children and Families Foundation, 2010). This number has increased by almost 5,000 children in the last five years. The need to address inequalities in opportunity, beginning at birth is a critical investment in our nation's social and economic future. Preliminary Nebraska data tells us that the right kinds of intervention during the critical 0-5 window mean children who are at risk of school failure not only arrive at kindergarten on par (academically, socially, and emotionally) with their peers, but that the gains last.





% OF CHILDREN IN U.S. UNDER AGE 6 WITH ALL PARENTS IN WORK FORCE

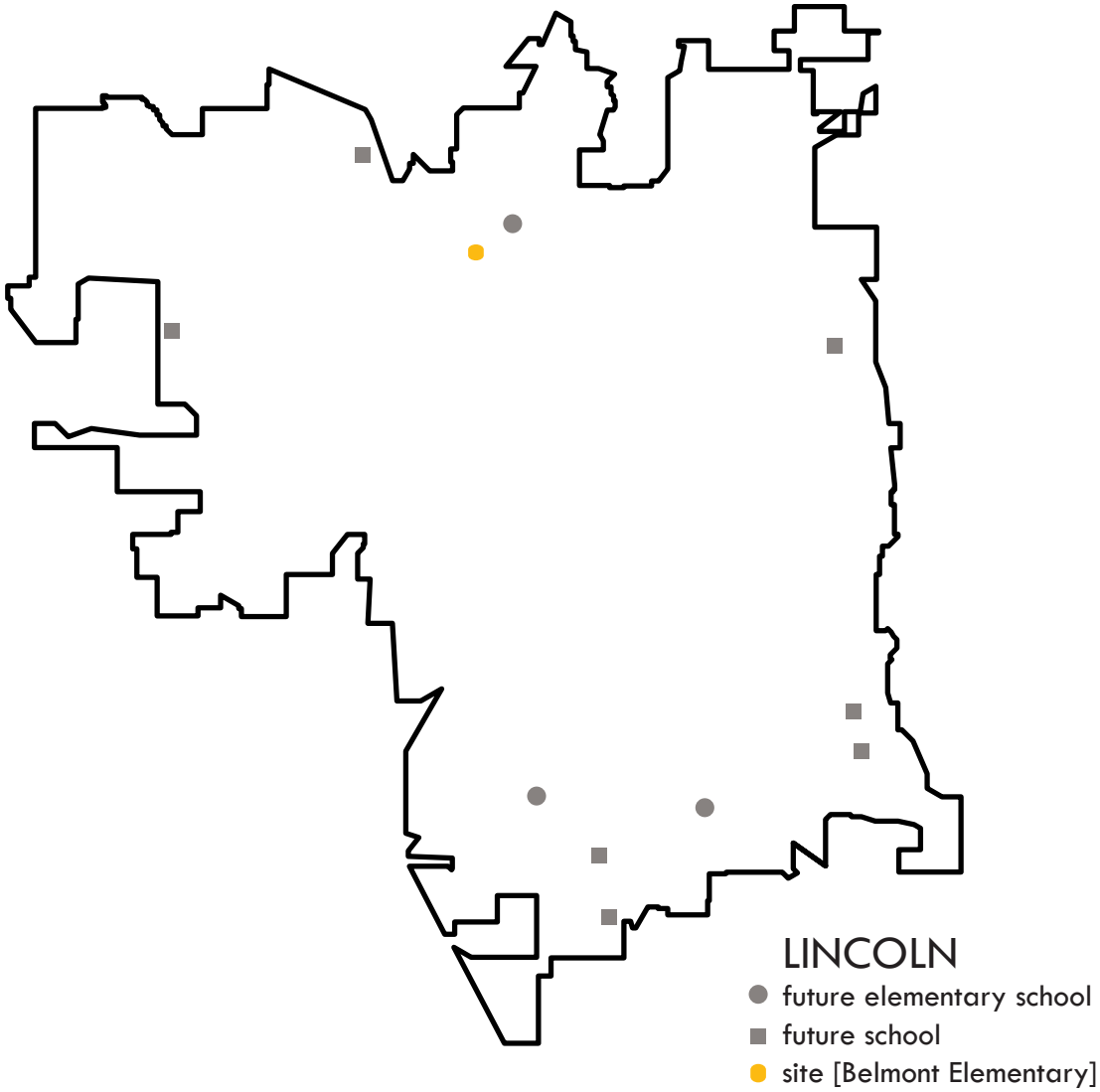
U.S. Census Bureau, 2006-2008

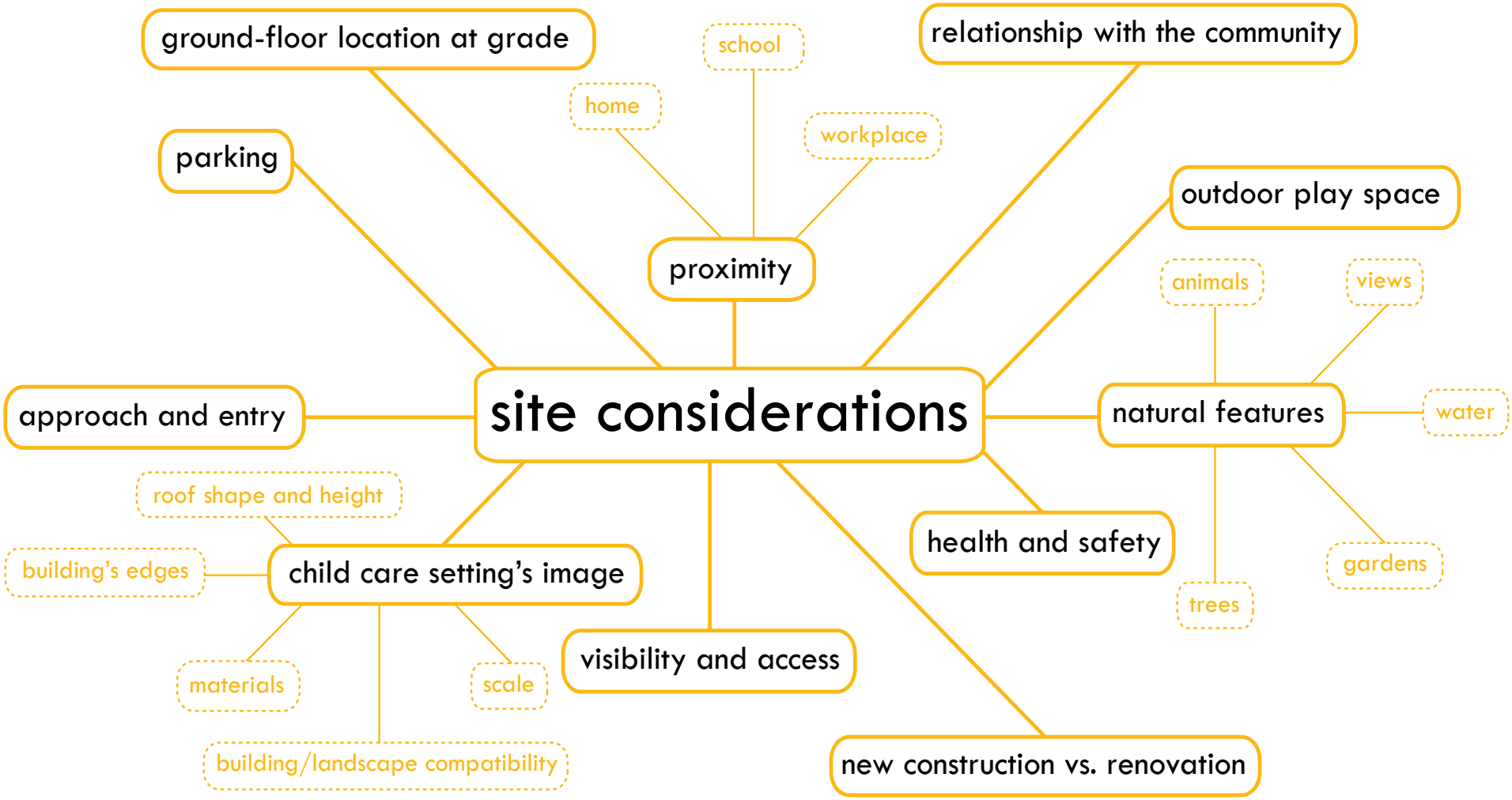


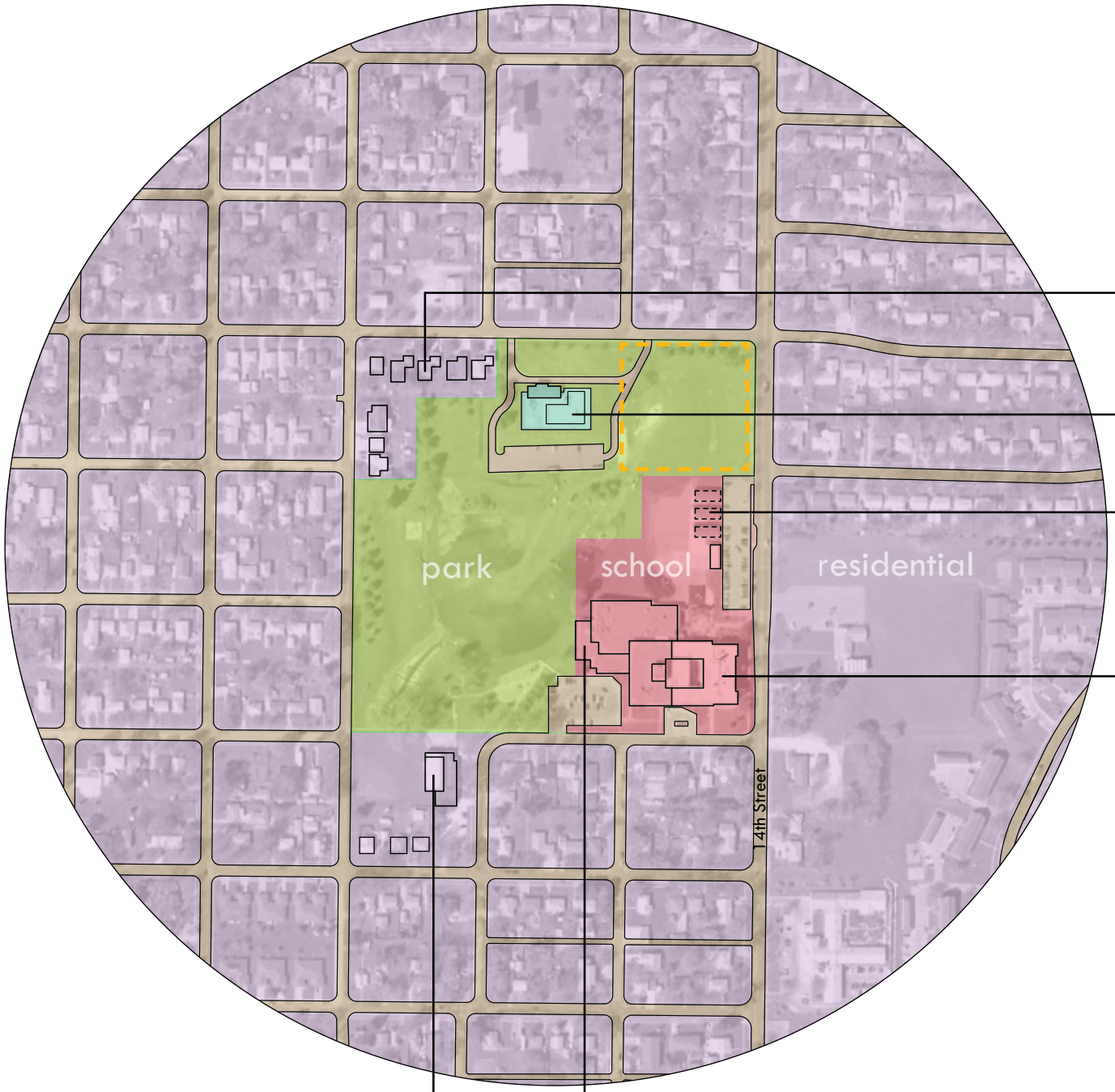
CHILDREN AT RISK IN NEBRASKA ON THE RISE

Nebraska Children and Families Foundation, 2010

Nearly 7,000 children in Lancaster County are at risk - lacking a nurturing home, a stable family, or a safe neighborhood. Currently about 50% of the students in Lincoln Public Schools, preschool through fifth grade, live in poverty. The site of Belmont elementary school was chosen as a case study, with 72% of the students living in poverty. The infill site will allow the early learning center to become part of the existing community's infrastructure.




site considerations
ground-floor location at grade
parking
proximity
school
home
workplace
relationship with the community
outdoor play space
natural features
animals
views
water
gardens
trees
approach and entry
child care setting's image
roof shape and height
building's edges
materials
scale
building/landscape compatibility
visibility and access
health and safety
new construction vs. renovation



residential housing

swimming pool

portables

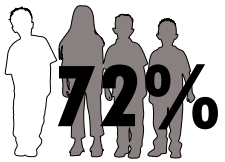
19 students X 3=57 students (remove)

Belmont Elementary School

750 students

pre-k=50 children (move to new center)

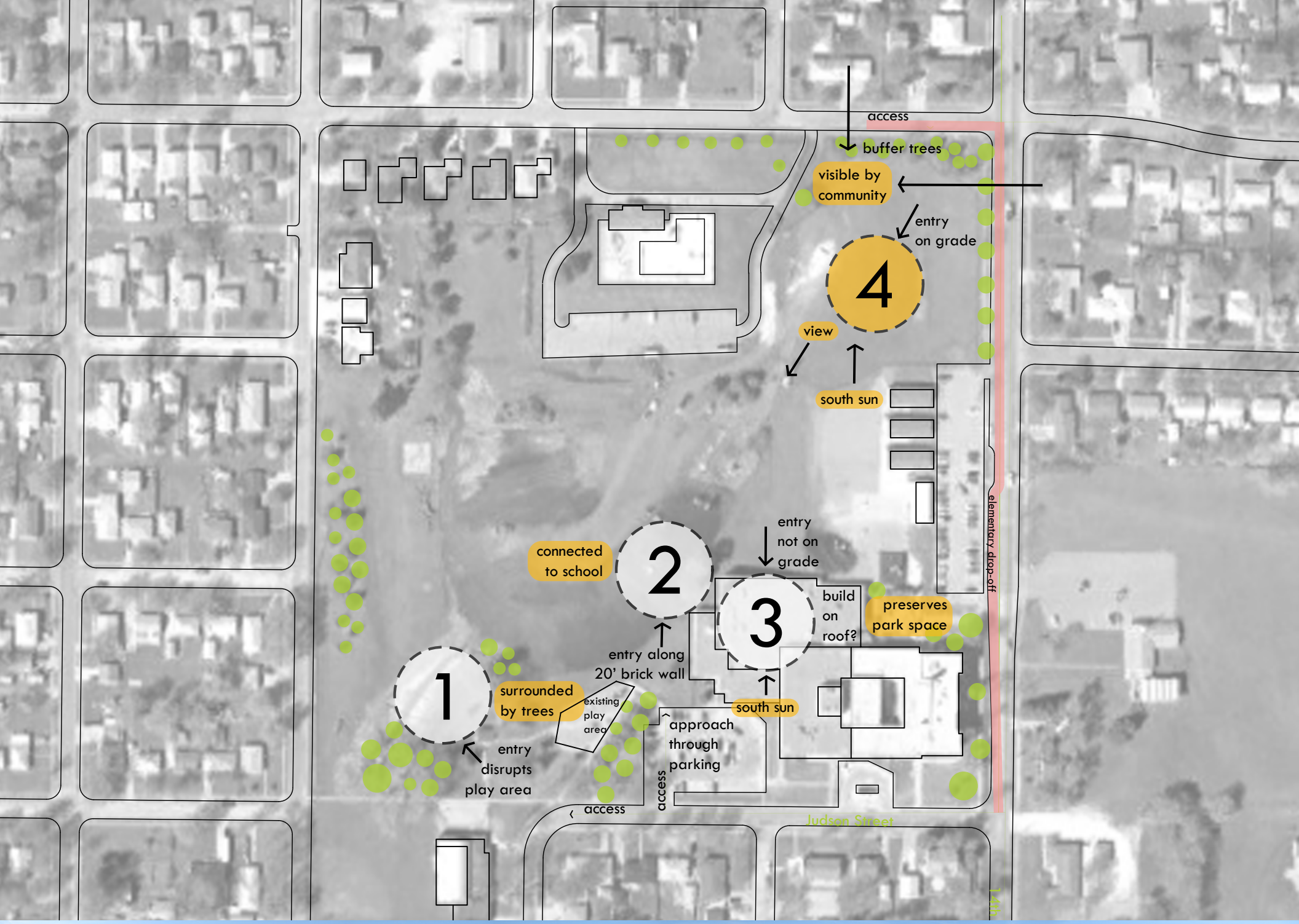
1st-5th grade=700 students

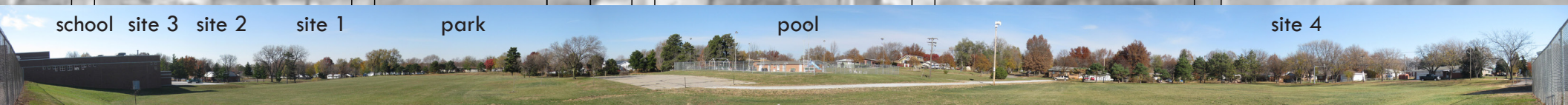


qualify for free
or reduced meals

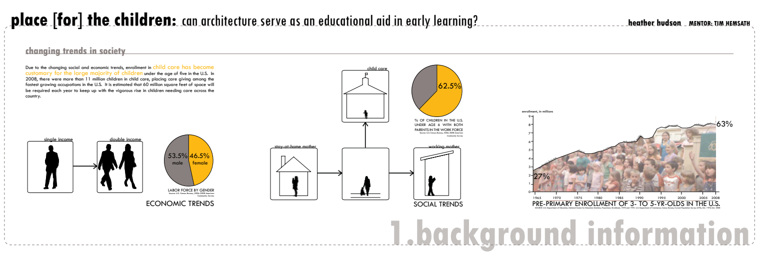
Belmont Recreation Center

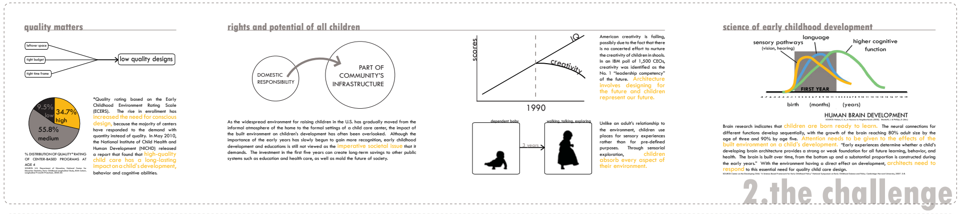
Belmont Community Center

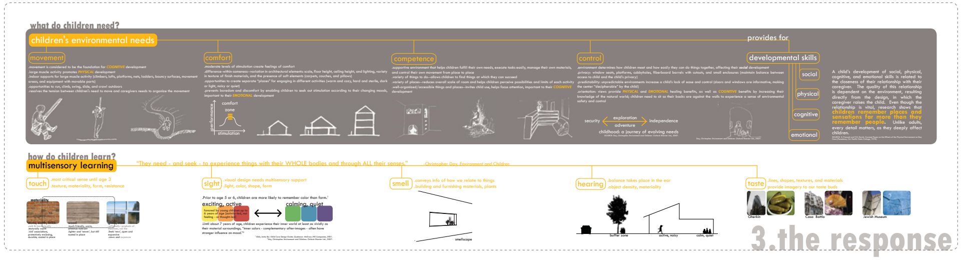

access
buffer trees
visible by community
entry on grade
4
view
south sun
elementary drop-off
entry not on grade
connected to school
2
3
build on roof?
preserves park space
entry along 20' brick wall
1
surrounded by trees
existing play area
south sun
approach through parking
entry disrupts play area
access
access
Judson Street
14th

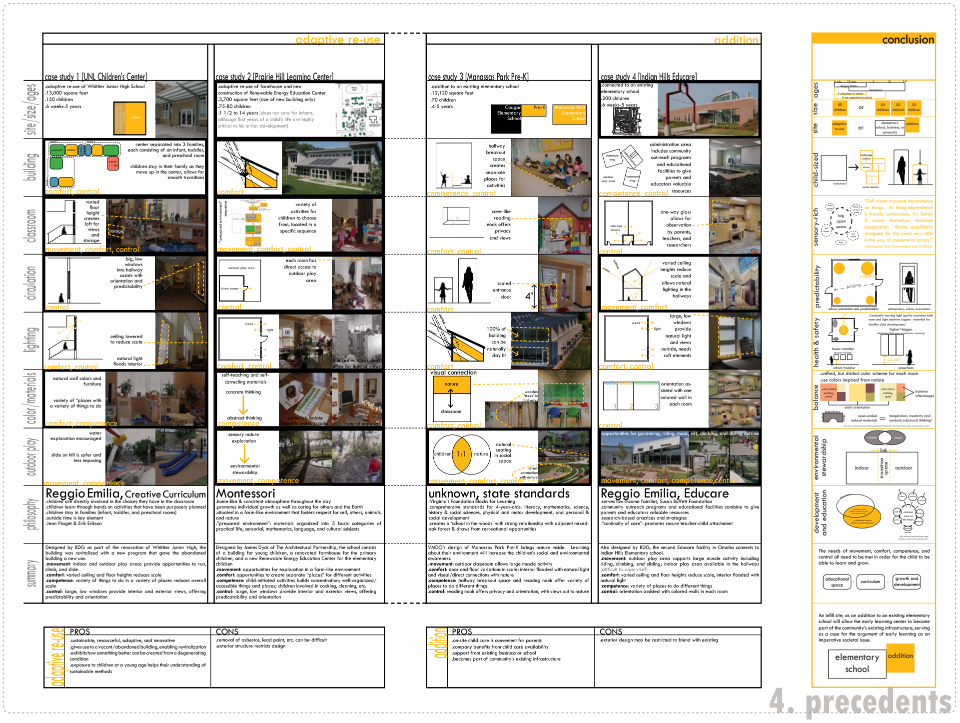

school
site 3
site 2
site 1
park
pool
site 4

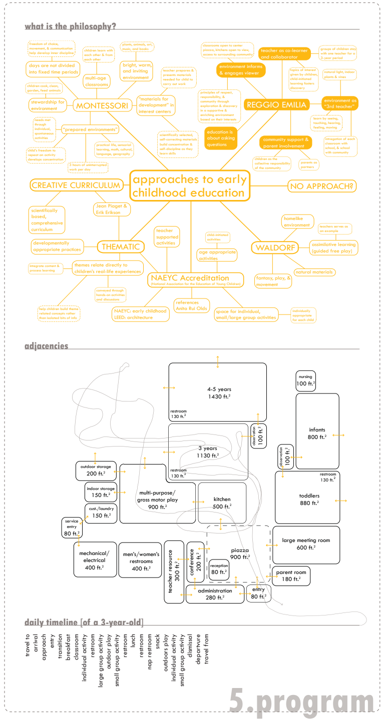

abstract

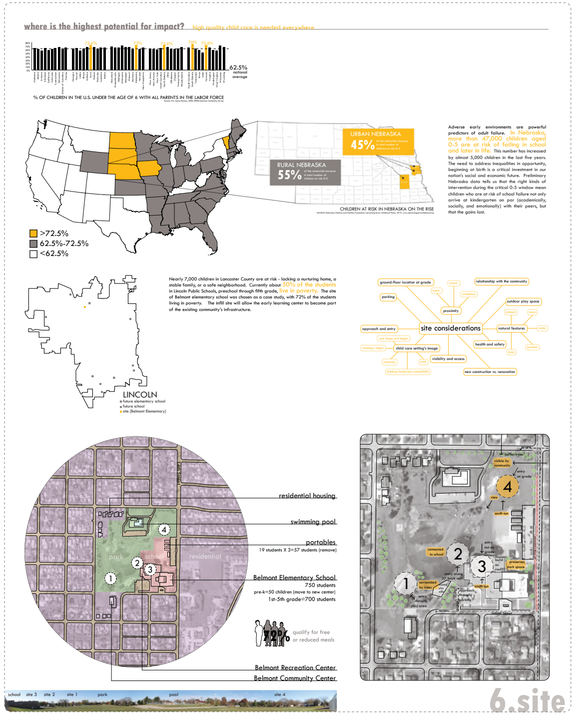

place [for] the children: can architecture serve as an educational aid in early learning?
heather hudson
MENTOR: TIM HEMSATH
changing trends in society
single income
double income
53.5% male
46.5% female
ECONOMIC TRENDS
stay-at-home mother
working mother
child care
62.5%
SOCIAL TRENDS
63%
27%
PRE-PRIMARY ENROLLMENT OF 3- TO 5-YR-OLDS IN THE U.S.
1.background information

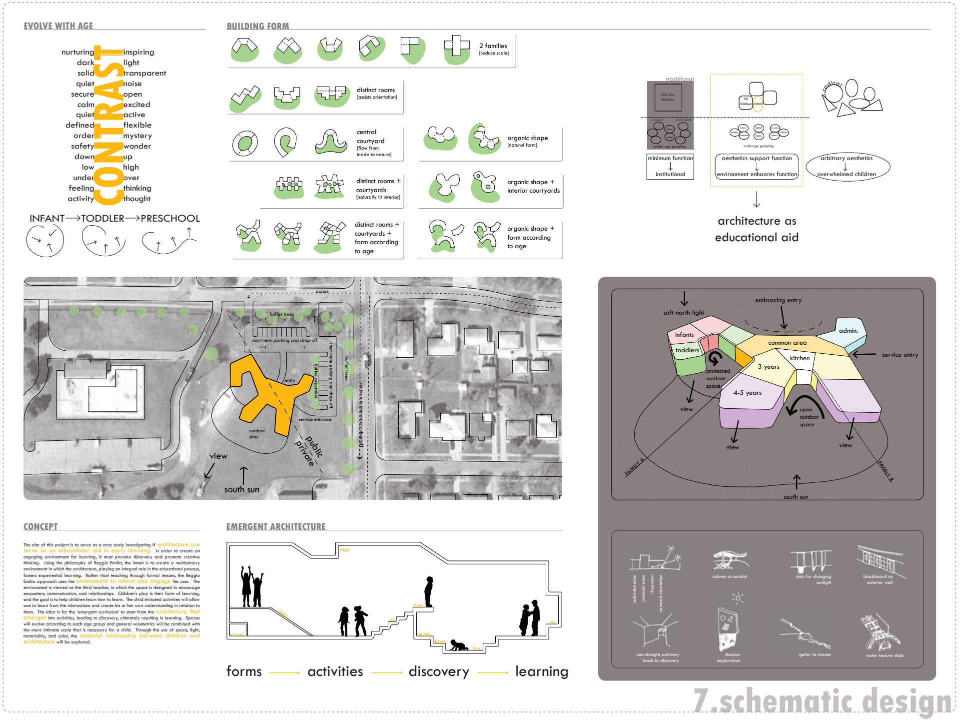

quality matters
low quality designs
34.7% high
9.5%
55.8% medium
rights and potential of all children
DOMESTIC RESPONSIBILITY
PART OF COMMUNITY'S INFRASTRUCTURE
scores
IQ
creativity
1990
science of early childhood development
sensory pathways
language
higher cognitive function
FIRST YEAR
birth (months) (years)
HUMAN BRAIN DEVELOPMENT
2.the challenge


what do children need?
children's environmental needs
provides for
movement
comfort
competence
control
developmental skills
social
physical
cognitive
emotional
how do children learn?
multisensory learning
touch
sight
smell
hearing
taste
exciting, active
calming, quiet
3.the response


adaptive re-use
addition
conclusion
case study 1 [UNL Children's Center]
case study 2 [Prairie Hill Learning Center]
case study 3 [Manassas Park Pre-K]
case study 4 [Indian Hills Educare]
site / size / ages
building
classroom
circulation
lighting
color / materials
outdoor play
philosophy
summary
Reggio Emilia, Creative Curriculum
Montessori
unknown, state standards
Reggio Emilia, Educare
PROS
CONS
child-sized
sensory-rich
predictability
health & safety
balance
environmental stewardship
development and education
elementary school
addition
4. precedents

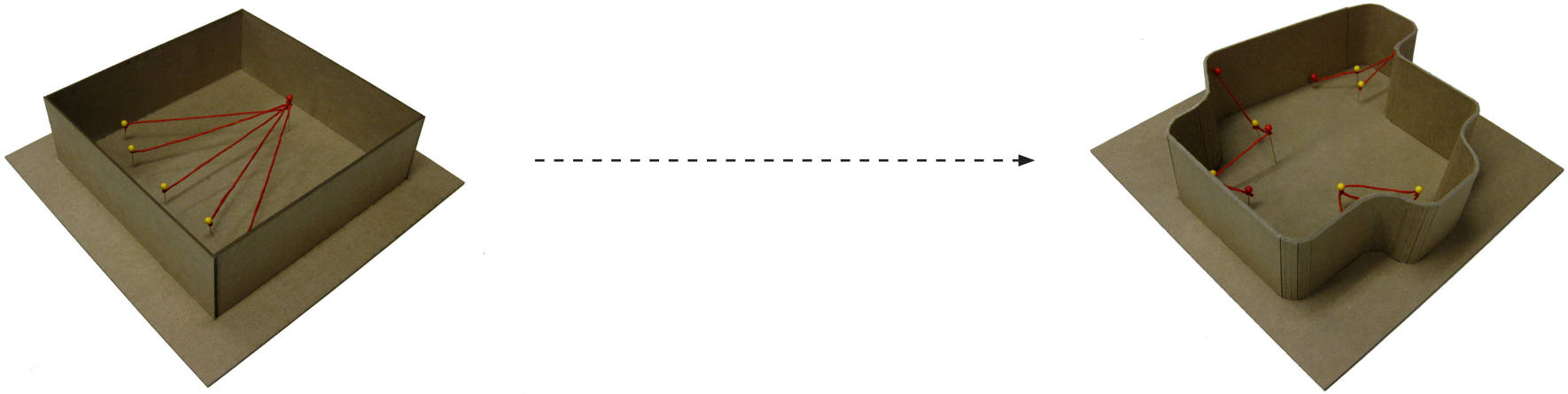

what is the philosophy?
MONTESSORI
REGGIO EMILIA
approaches to early childhood education
CREATIVE CURRICULUM
NO APPROACH?
THEMATIC
WALDORF
NAEYC Accreditation
adjacencies
4-5 years 1430 ft²
3 years 1130 ft²
infants 800 ft²
toddlers 880 ft²
kitchen 500 ft²
multi-purpose/gross motor play 900 ft²
large meeting room 600 ft²
piazza 900 ft²
administration 280 ft²
daily timeline [of a 3-year-old]
5.program


where is the highest potential for impact?
62.5%
URBAN NEBRASKA 45%
RURAL NEBRASKA 55%
>72.5%
62.5%-72.5%
<62.5%
LINCOLN
site considerations
residential housing
swimming pool
portables
Belmont Elementary School
Belmont Recreation Center
Belmont Community Center
6.site

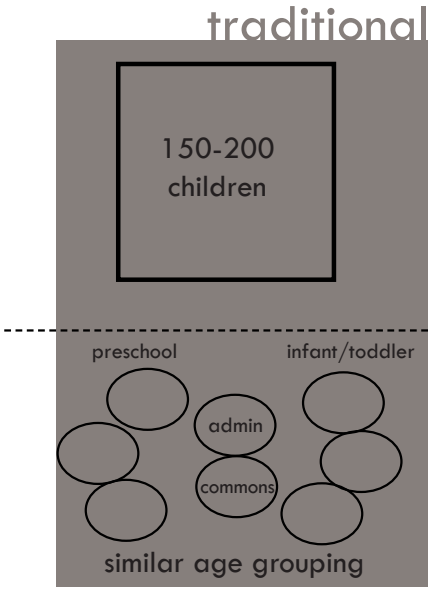

EVOLVE WITH AGE
CONTRAST
nurturing
inspiring
INFANT → TODDLER → PRESCHOOL
BUILDING FORM
distinct rooms
central courtyard
organic shape
CONCEPT
EMERGENT ARCHITECTURE
forms
activities
discovery
learning
traditional
architecture as educational aid
infants
toddlers
3 years
4-5 years
common area
kitchen
admin.
7.schematic design

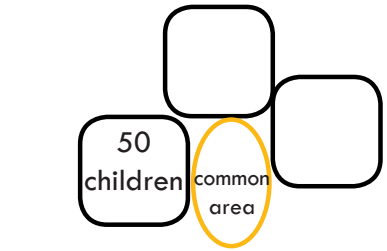
initial proposal

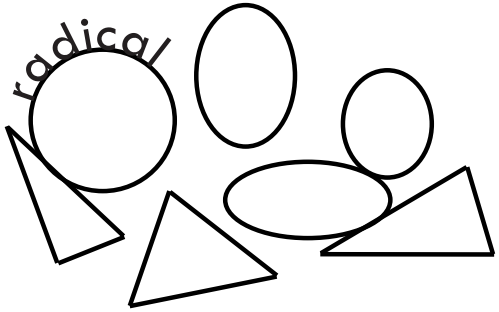
The aim of this project was to serve as a case study investigating how architecture can serve as an educational aid in early learning. In order to create an engaging environment for learning, it must provoke discovery and promote creative thinking. Using the philosophy of Reggio Emilia, the intent was to create a multisensory environment in which the architecture, playing an integral role in the educational process, fosters experiential learning. Rather than teaching through formal lessons, the Reggio Emilia approach uses the environment to inform and engage the user. The environment is viewed as the third teacher, in which the space is designed to encourage encounters, communication, and relationships. Children's play is their form of learning, and the goal is to help children learn how to learn. The child-initiated activities allow one to learn from the interactions and create his or her own understanding in relation to them. The idea was for the 'emergent curriculum' to stem from the architecture that emerges into activities, leading to discovery, ultimately resulting in learning. Spaces evolve according to each age group and general volumetrics are combined with the more intimate scale that is necessary for a child. Through the use of space, light, materiality, and color, the sensorial relationship between children and architecture is explored. Rather than placing children in an arbitrary environment, a place was created [for] them, where the design is integral to their education and development.



schematic design







multi-age grouping

minimum function
↓
institutional

design supports function
↓
environment enhances function

arbitrary aesthetics
↓
overwhelmed children

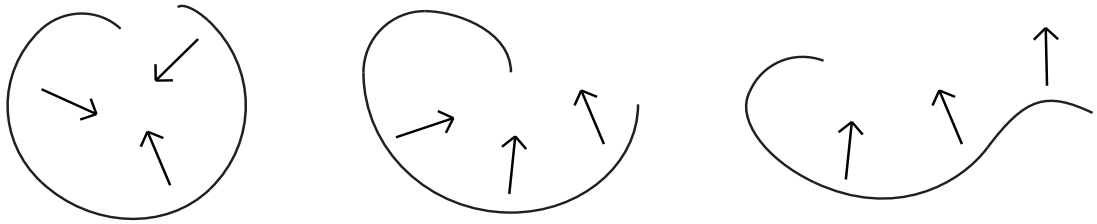
↓

architecture as educational aid

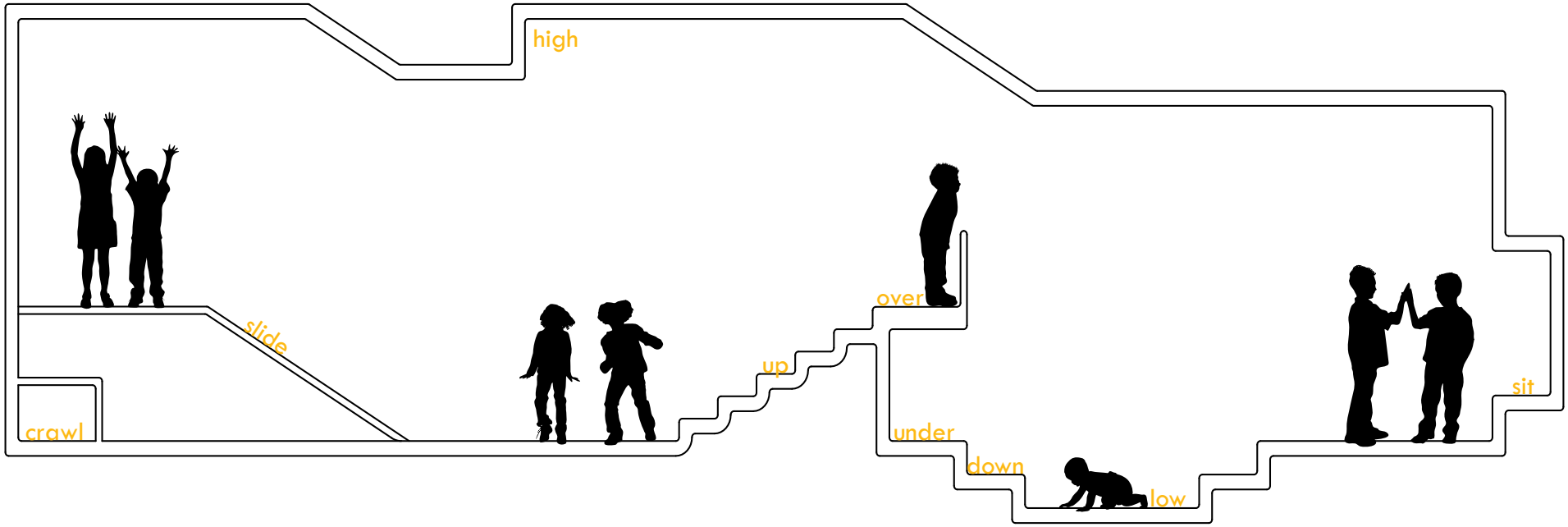
CONTRAST

	balanced	
nurturing		inspiring
dark		light
solid		transparent
quiet		noise
secure		open
calm		excited
quiet		active
defined		flexible
order		mystery
safety		wonder
down		up
low		high
under		over
feeling		thinking
activity		thought

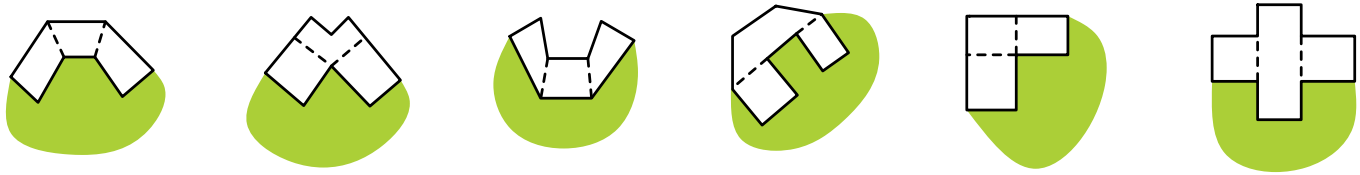
INFANT ⟶ TODDLER ⟶ PRESCHOOL



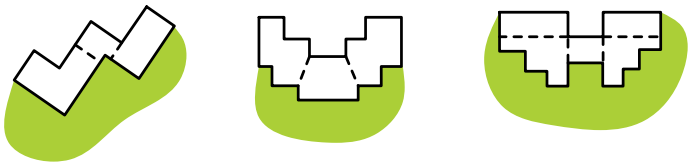
emergent architecture



forms → activities → discovery → learning

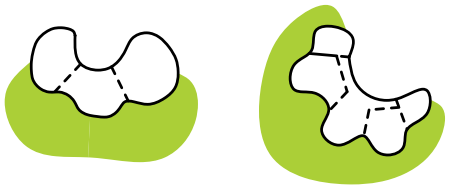


2 families
[reduce scale]

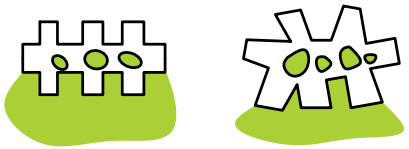


distinct rooms
[assists orientation]

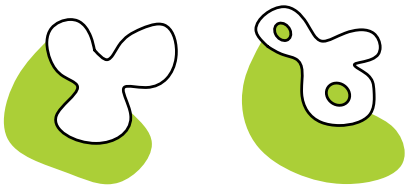
central courtyard
[flow from inside to nature]



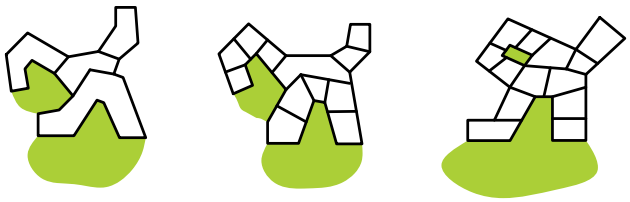
organic shape
[natural form]



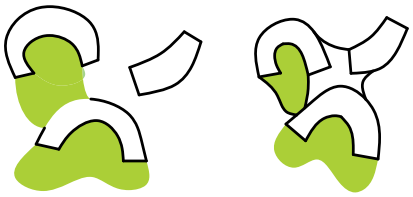
distinct rooms + courtyards
[naturally lit interior]



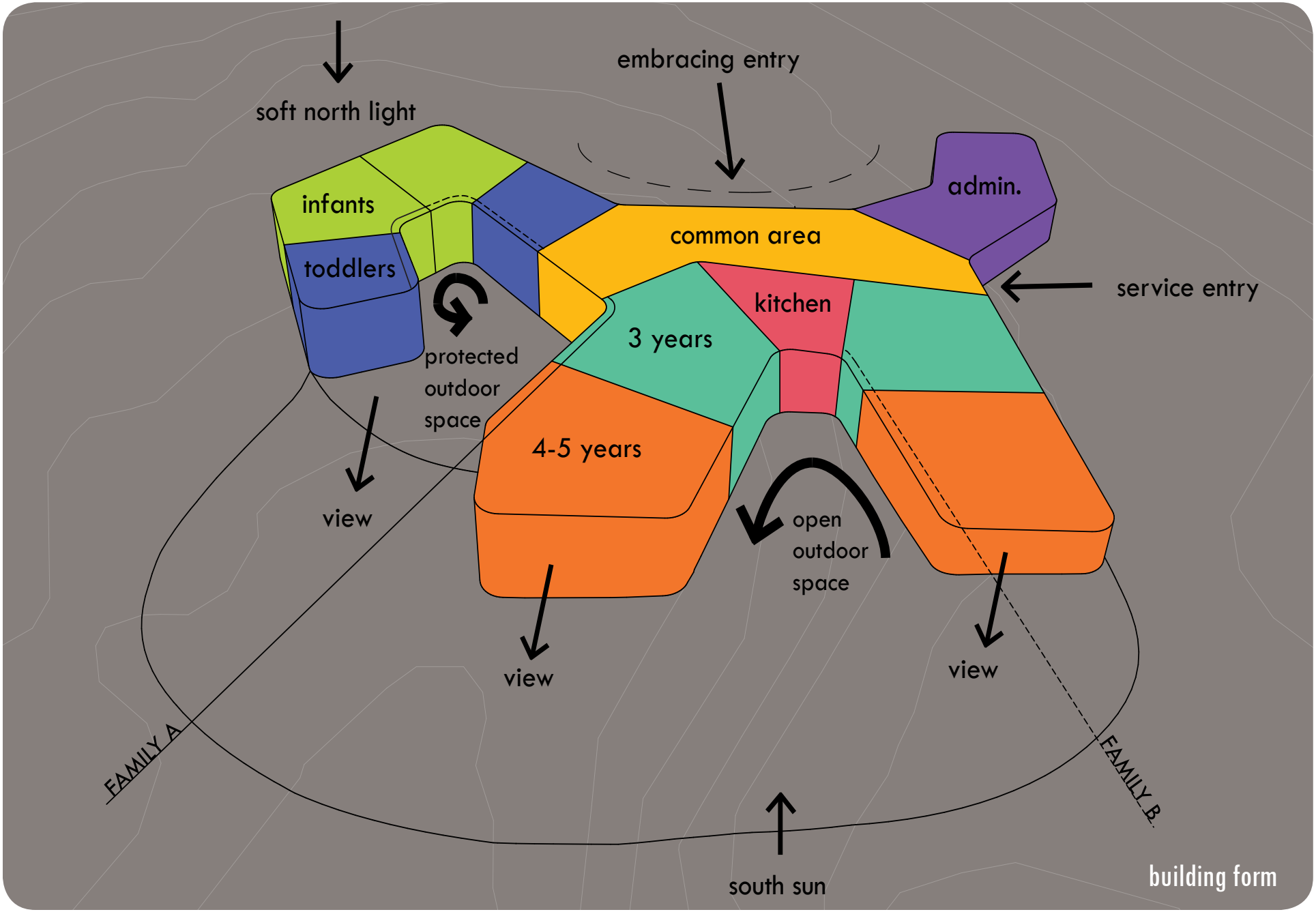
organic shape + interior courtyards



distinct rooms + courtyards + form according to age



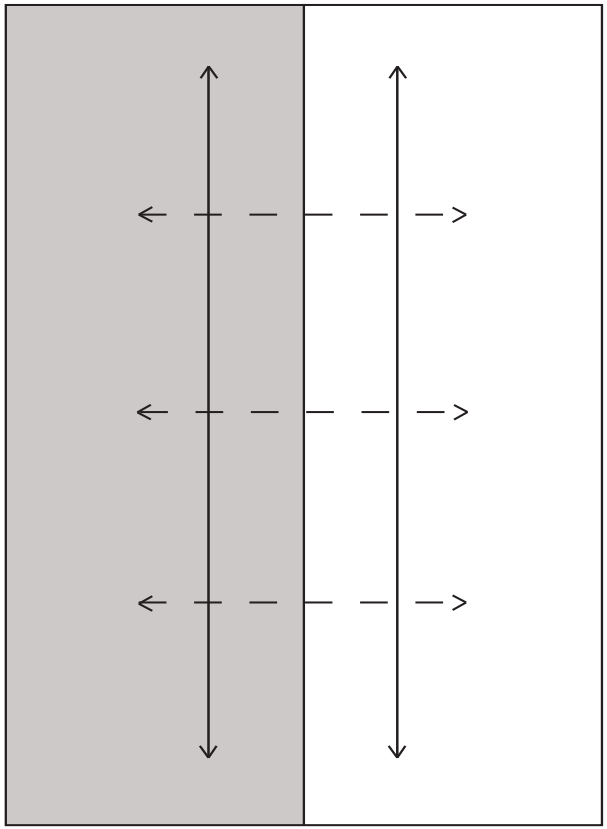
organic shape + form according to age


soft north light
embracing entry
infants
toddlers
common area
admin.
service entry
kitchen
3 years
protected
outdoor
space
4-5 years
view
open
outdoor
space
view
view
FAMILY A
FAMILY B
south sun
building form

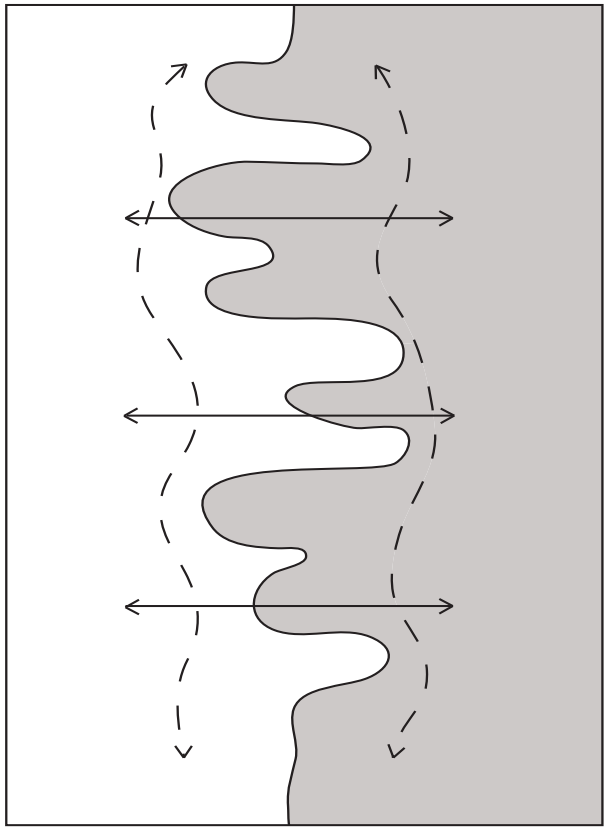
process

edge conditions

straight boundaries

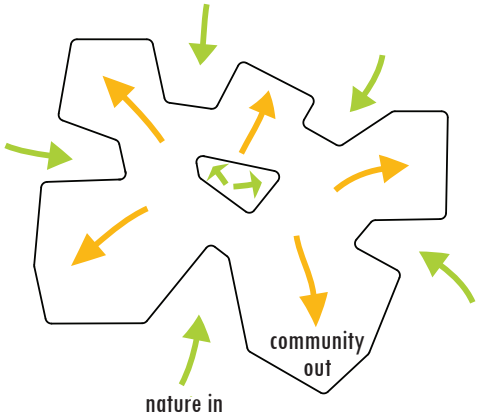


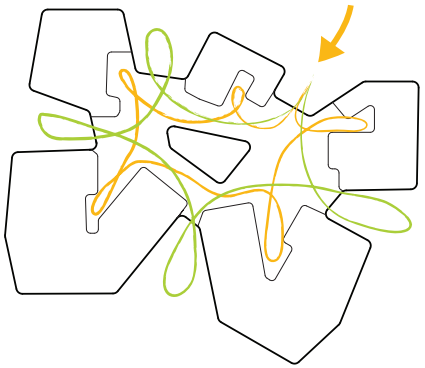
curvilinear boundaries



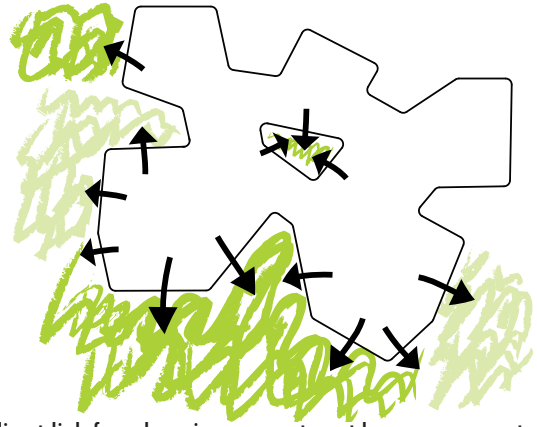
Taschen, 2001

community ⟷ flow ⟷ nature

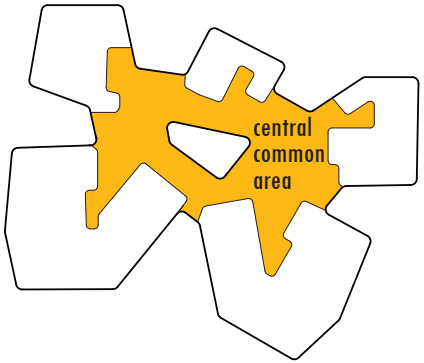


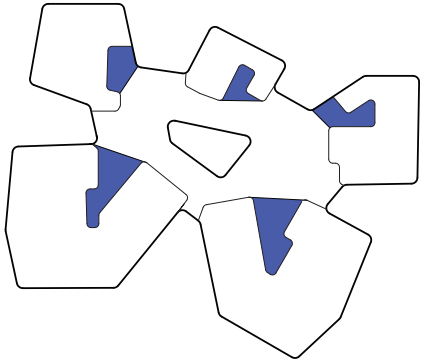


common area eliminates need for corridors

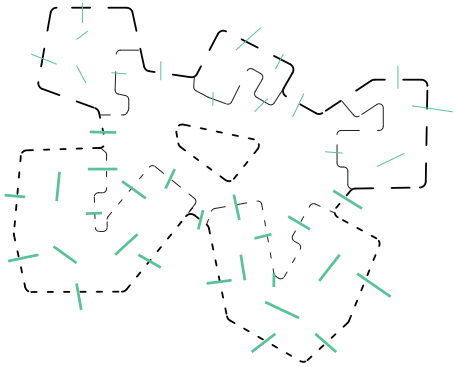


direct link from learning spaces to outdoor spaces creates an osmotic relationship

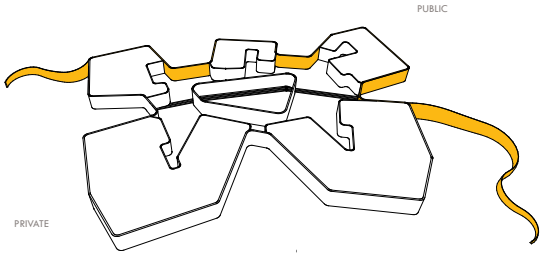




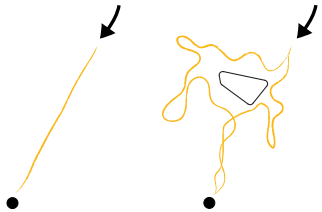
sub-common spaces outside rooms provide transitional filter zones, encouraging easy, unhurried exchange of information

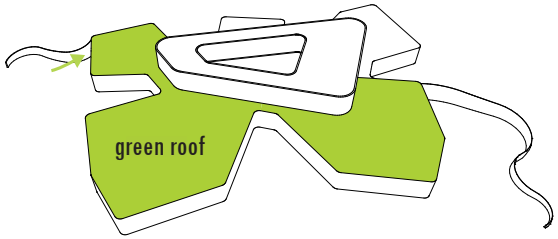


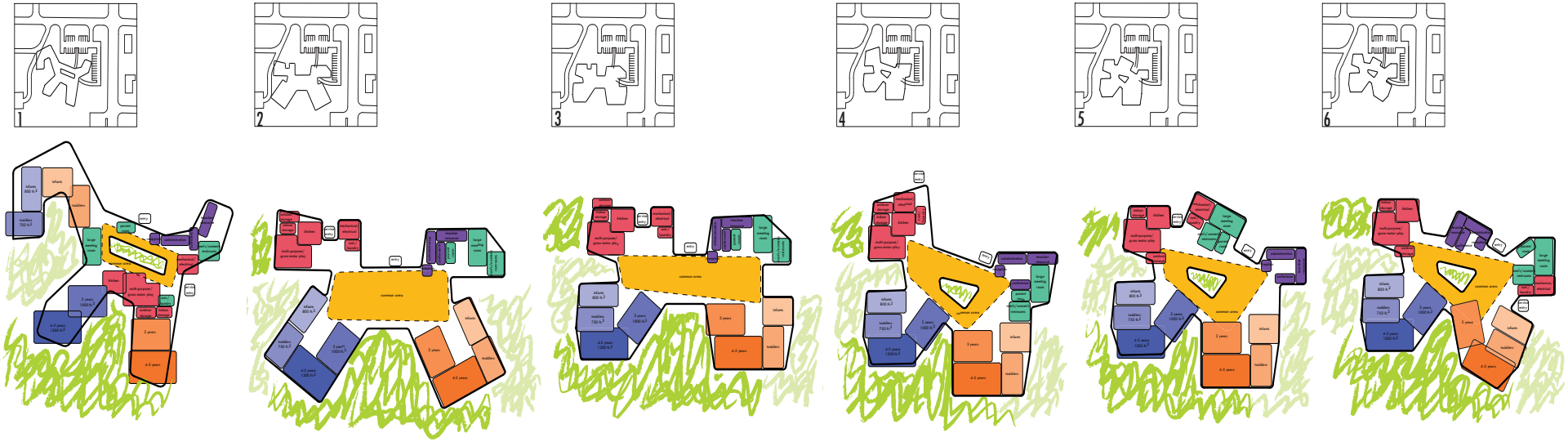
varied transparencies allow communication in, out, and between



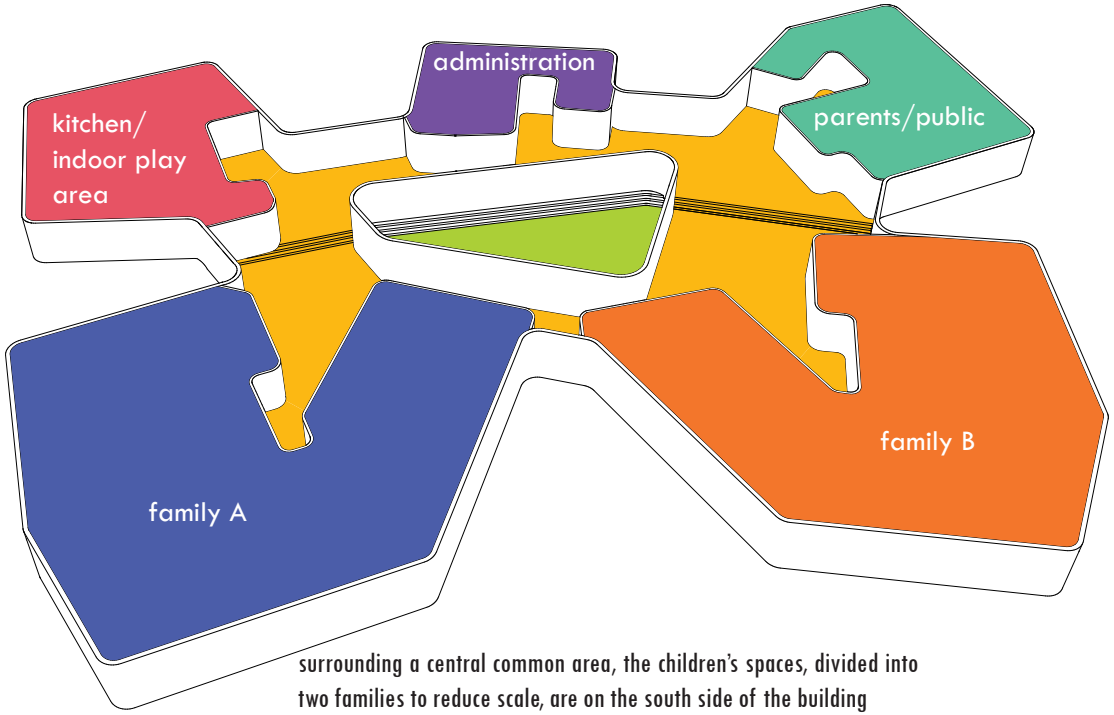
2nd skin serves as a backdrop onto which the children's ideas become part of the school's learning program and culture, allowing interior and exterior communicaiton by the building







PUBLIC



PRIVATE

surrounding a central common area, the children's spaces, divided into two families to reduce scale, are on the south side of the building

program

administrative area:

.entry vestibule_80 sq. ft.
.reception_80 sq. ft.
.director's office_140 sq. ft.
.asst. director's office_140 sq. ft.
.conference room_200 sq. ft.
.teacher resource/workroom_300 sq. ft.

administration
860 ft.2

parent/public:

.parent resource room_180 sq. ft.
.large meeting room_600 sq. ft.
.women/men's restroom_400 sq. ft.

parent/public
1180 ft.2

kitchen/dining/indoor play:

.kitchen_500 sq. ft.
.indoor play/dining area_32 children X 50'=1600 sq. ft.
.storage room_350 sq. ft.
.mechanical room_300 sq. ft.
.electrical room_100 sq. ft.
.custodian closet/laundry_150 sq. ft.
.service entrance

commons area_900 sq. ft.

kitchen/dining/
indoor play
3000 ft.2

family A:

.infants (birth-18 mos.)_2 teachers X 1:4 ratio=8 children X 100'=800 sq. ft.
.toddlers (18 mos.-3 yrs.)_2 teachers X 1:5 ratio=10 children X 75'=750 sq. ft.
.toddler restroom_130 sq. ft.
.preschool 1 (3 yr.-olds)_2 teachers X 1:7 ratio =14 children X 75'=1,050 sq. ft.
.preschool restroom_130 sq. ft.
.preschool 2 (4-5 yr.-olds)_2 teachers X 1:9 ratio = 18 children X 75' =1,350 sq. ft.
.preschool restroom_130 sq. ft.

family A
4000 ft.2
[50 children]

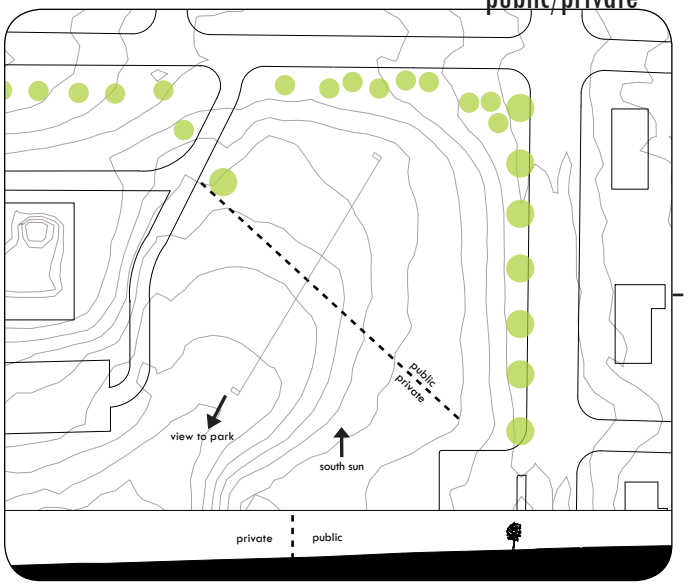
family B:

.infants (birth-18 mos.)_2 teachers X 1:4 ratio=8 children X 100'=800 sq. ft.
.toddlers (18 mos.-3 yrs.)_2 teachers X 1:5 ratio=10 children X 75'=750 sq. ft.
.toddler restroom_130 sq. ft.
.preschool 1 (3 yr.-olds)_2 teachers X 1:7 ratio =14 children X 75'=1,050 sq. ft.
.preschool restroom_130 sq. ft.
.preschool 2 (4-5 yr.-olds)_2 teachers X 1:9 ratio = 18 children X 75' =1,350 sq. ft.
.preschool restroom_130 sq. ft.

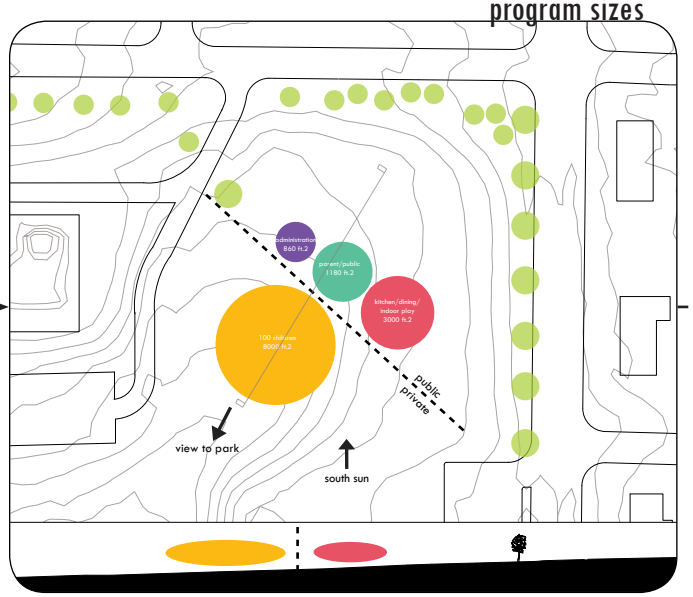
family B
4000 ft.2
[50 children]

=13560 ft.2

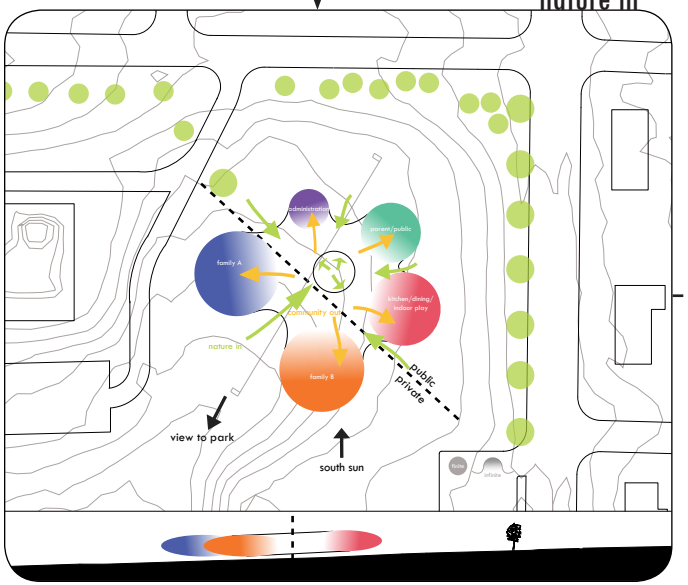
public/private



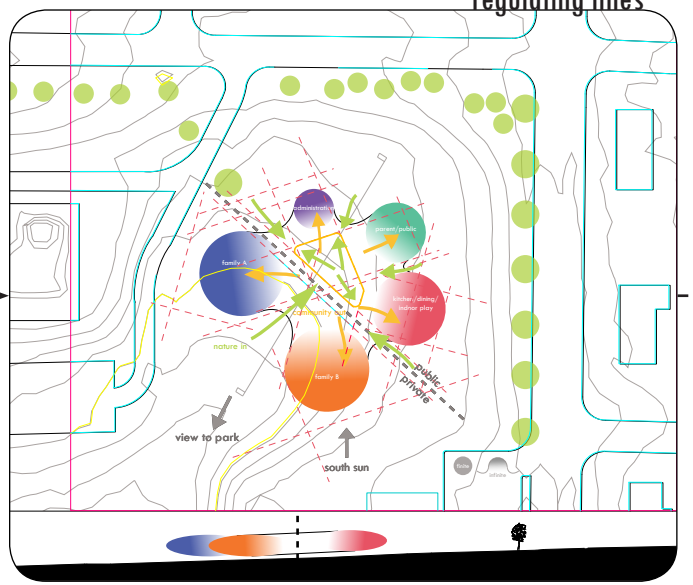
program sizes



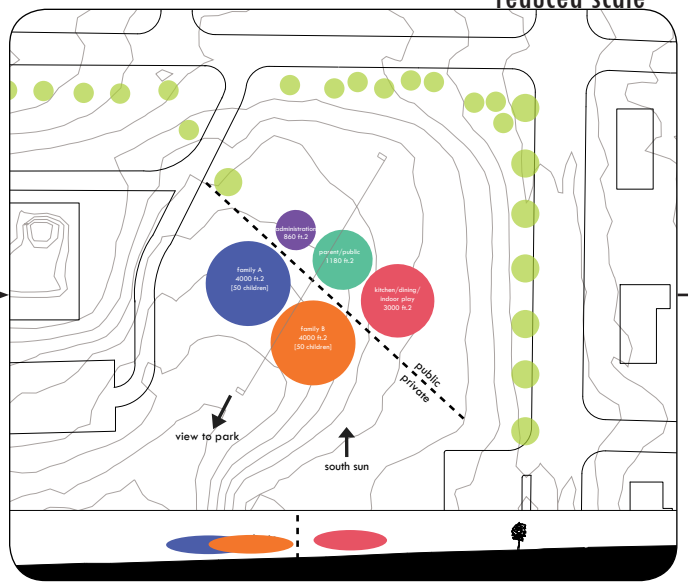
nature in



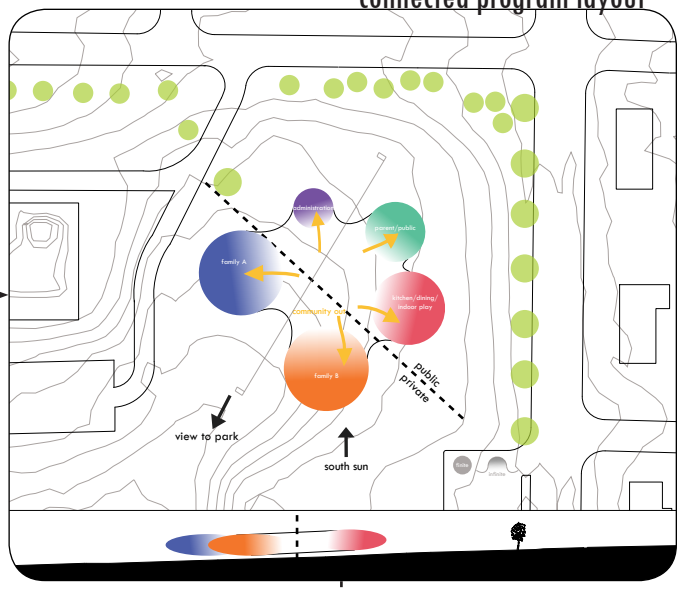
regulating lines



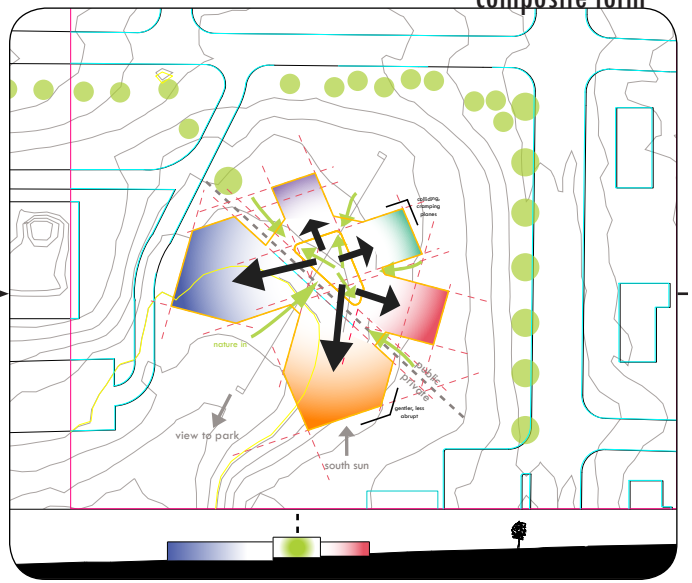
reduced scale



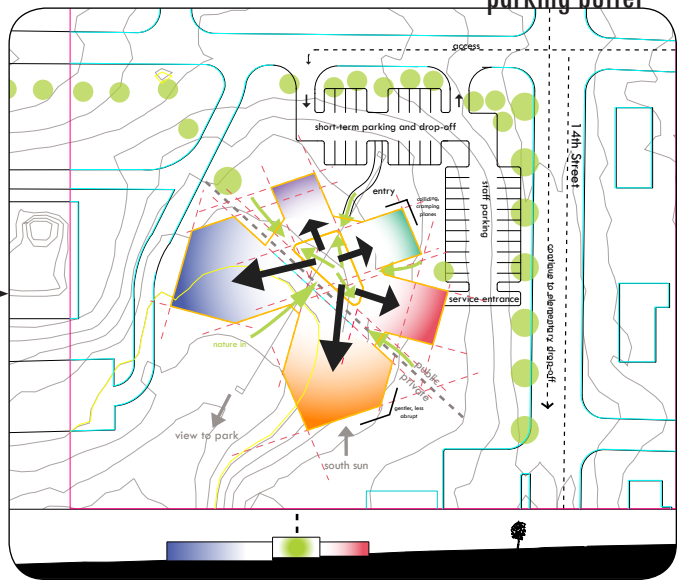
connected program layout

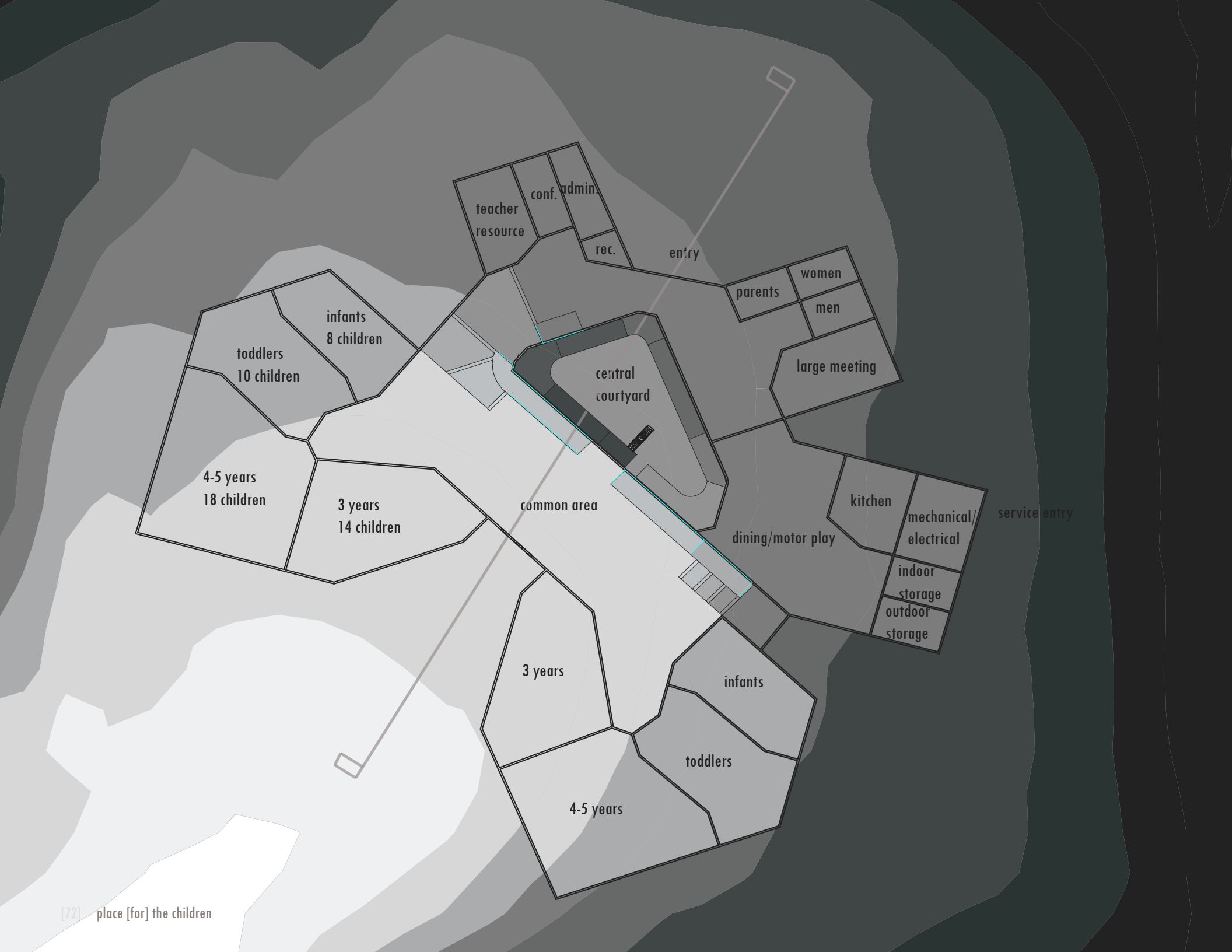


composite form

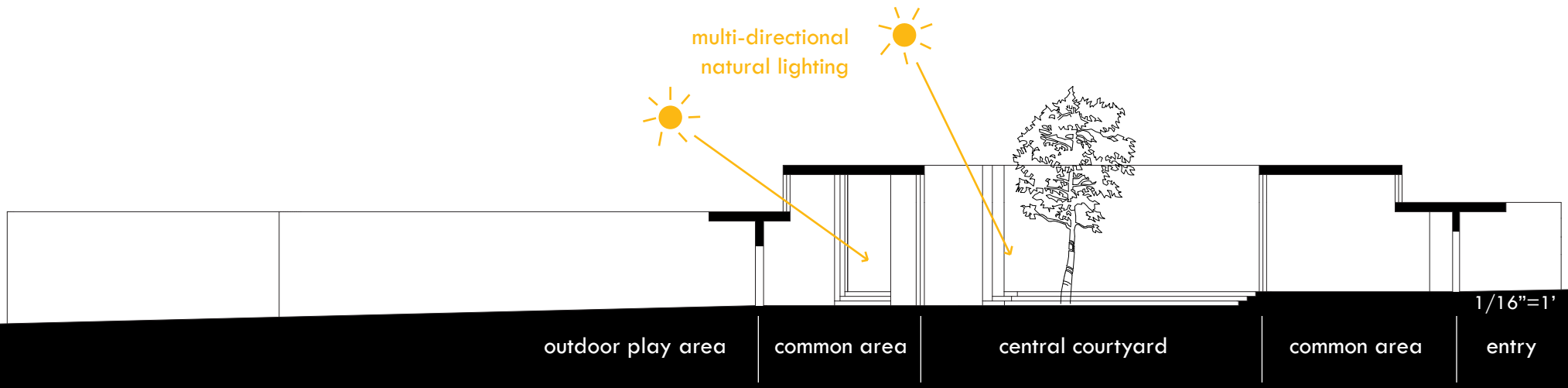


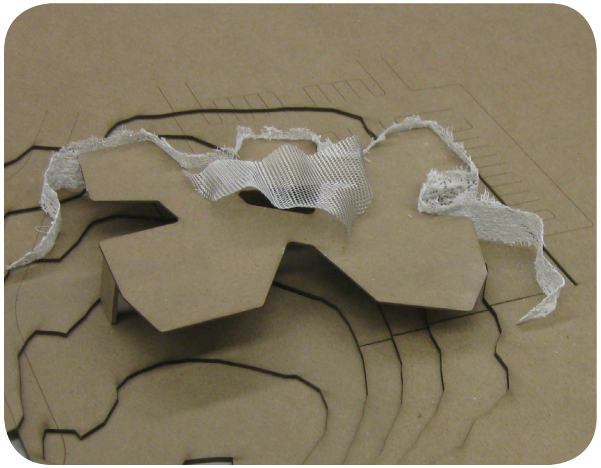
parking buffer

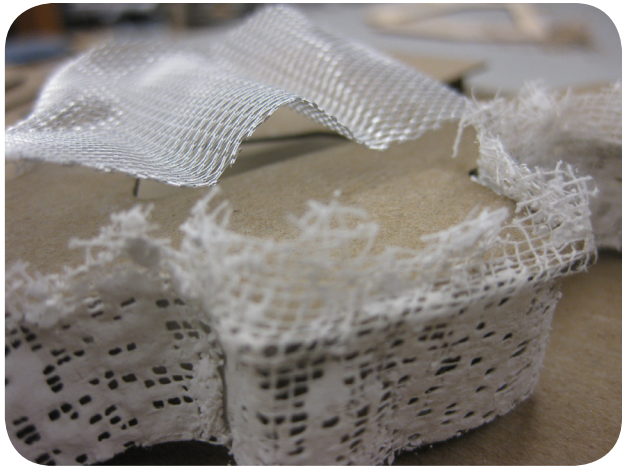



teacher
resource
conf.
admin.
rec.
entry
parents
women
men
large meeting
infants
8 children
toddlers
10 children
central
courtyard
4-5 years
18 children
3 years
14 children
common area
kitchen
mechanical/
electrical
service entry
dining/motor play
indoor
storage
outdoor
storage
3 years
infants
toddlers
4-5 years

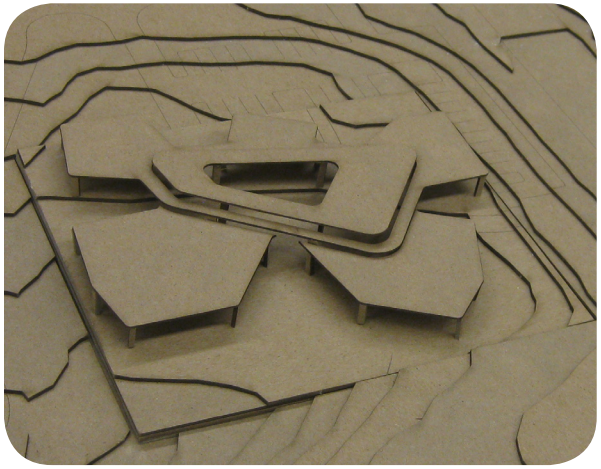
Following the natural contours of the site, the building has a four foot elevation change, sequencing from th public spaces to the private spaces. Changes in ceiling heights, along with the changing floor heights create a range in scale, important to a child's developing spatial awareness.

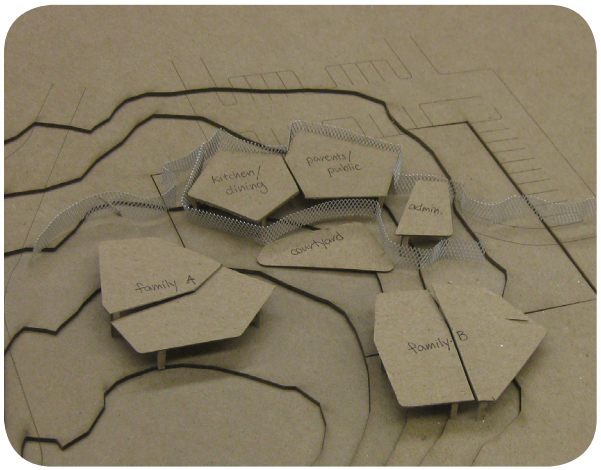




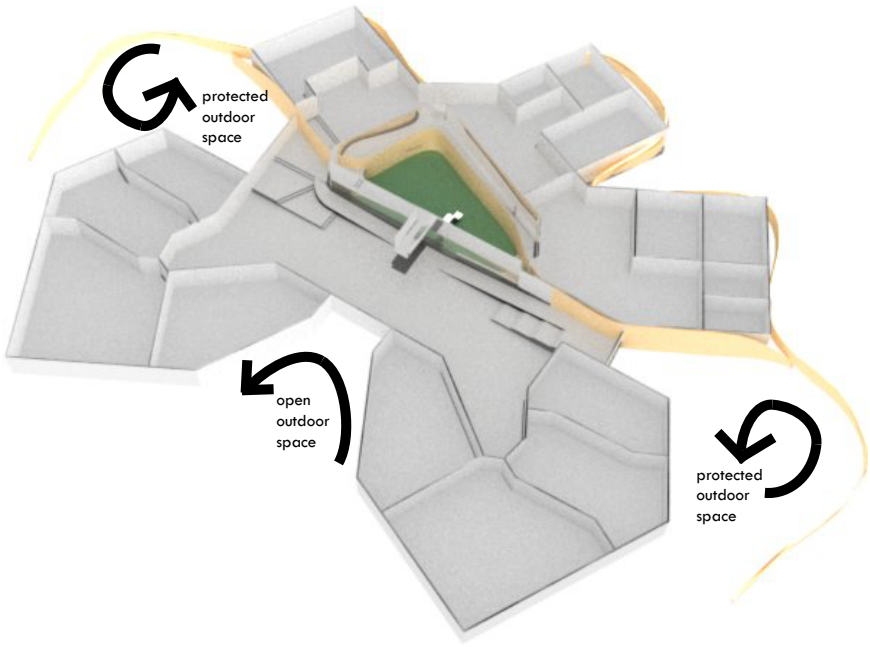



public
kitchen/
dining

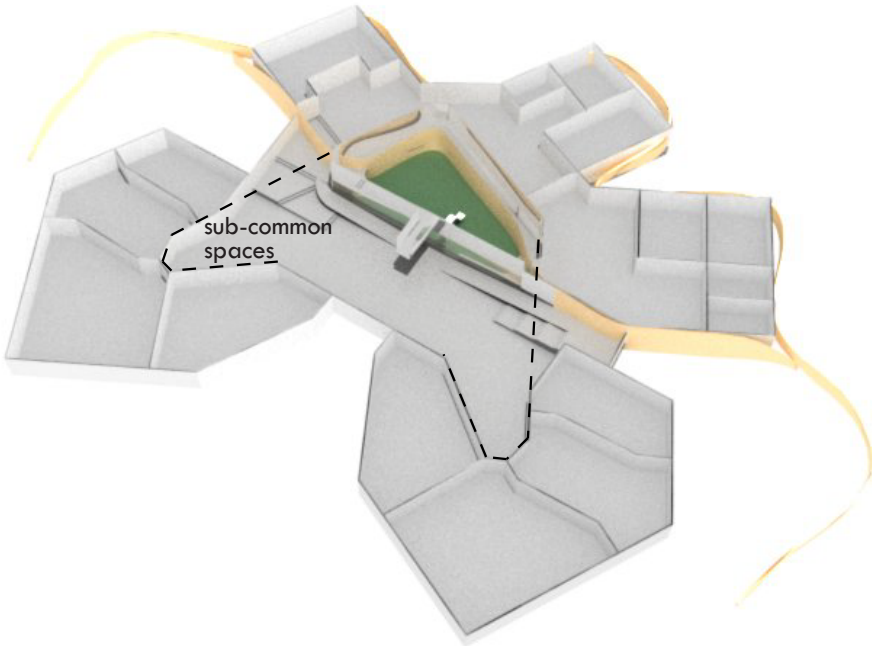



kitchen/
dining
parents/
public
admin
courtyard
family A
family B

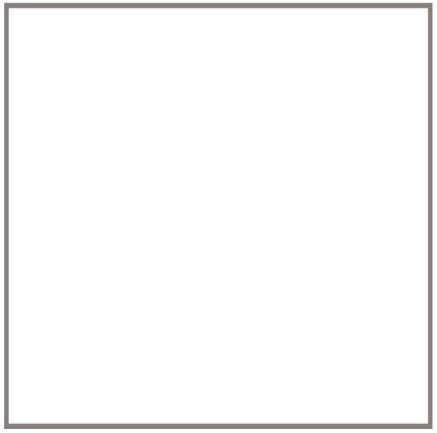

admin
public
kitchen/
dining
garden
garden



Even though many of my ideas changed throughout the design process, with several of them not making it into the final proposal, they all had an influence on the design. Through iterations of physical and digital study models, I explored different concepts related to mass, form, enclosure, and materiality. One idea included a 2nd skin that wrapped the public areas of the building, as well as forming outdoor protected spaces for the younger children. This later evolved into the concept for the interior walls.

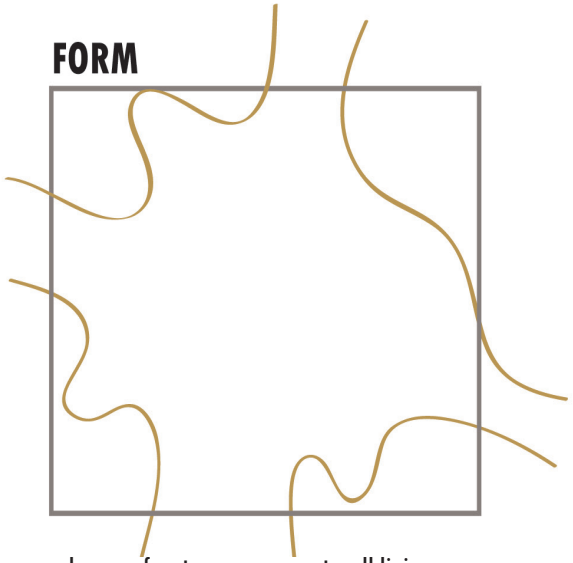


MASS



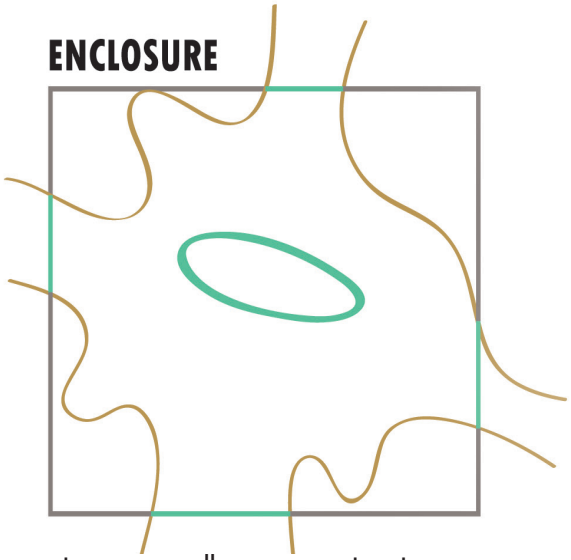
.shaped by human thought
.needed for order, concentration, and doing

FORM



.shapes of nature, movements, all living things
.needed for protection, socializationg, and being

ENCLOSURE

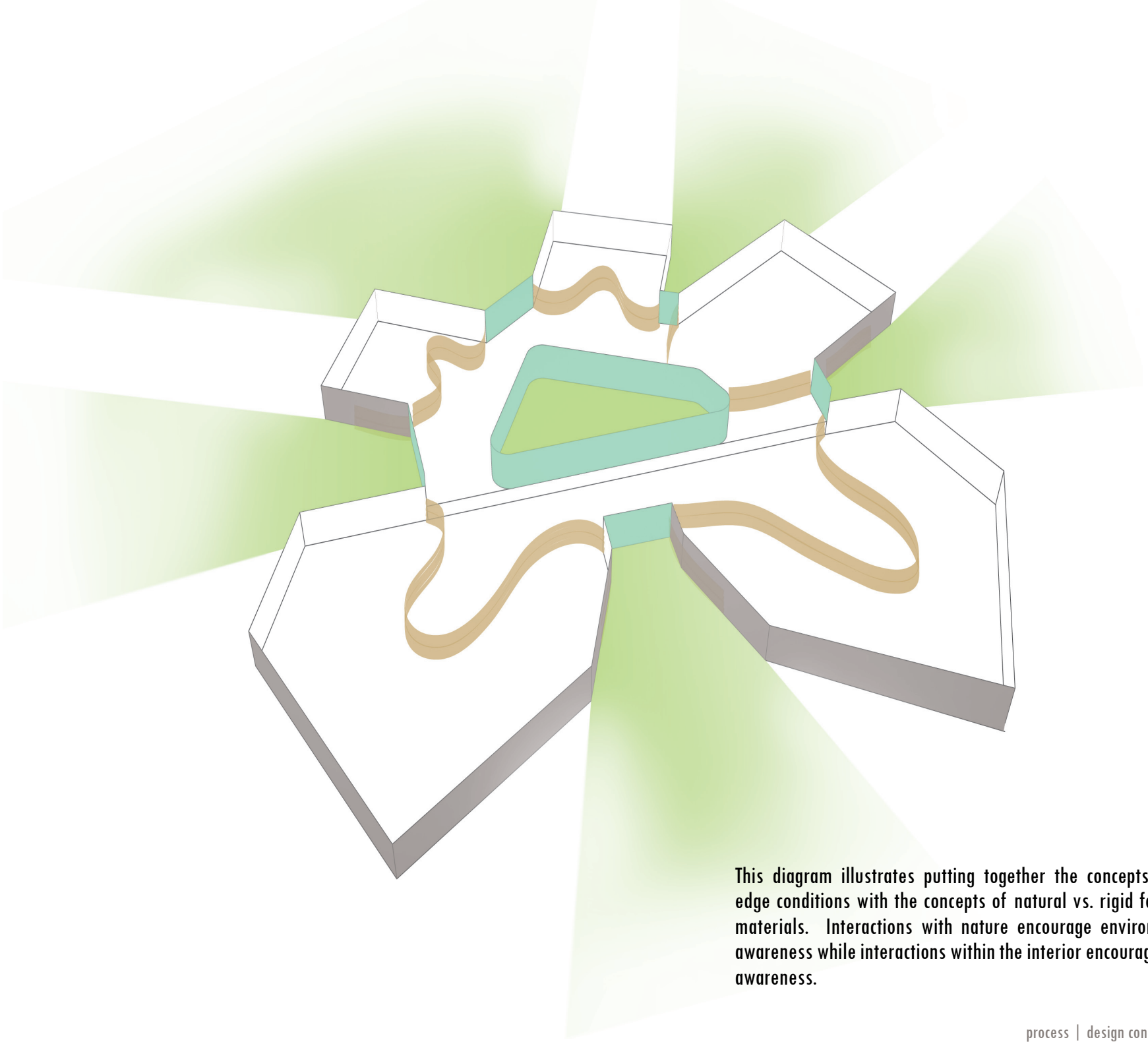


.transparency allows exposure to nature
.assists with orientation and wayfinding

concrete
.rigid, ordered exterior
.protectively enclosing and durable

wood
.organic, natural interior
.touch-friendly, warm, attention-tolerant
.connects social areas and filters into nature

glass
.open and expansive to nature
.allows views to nature and circulation, assisting with orientation

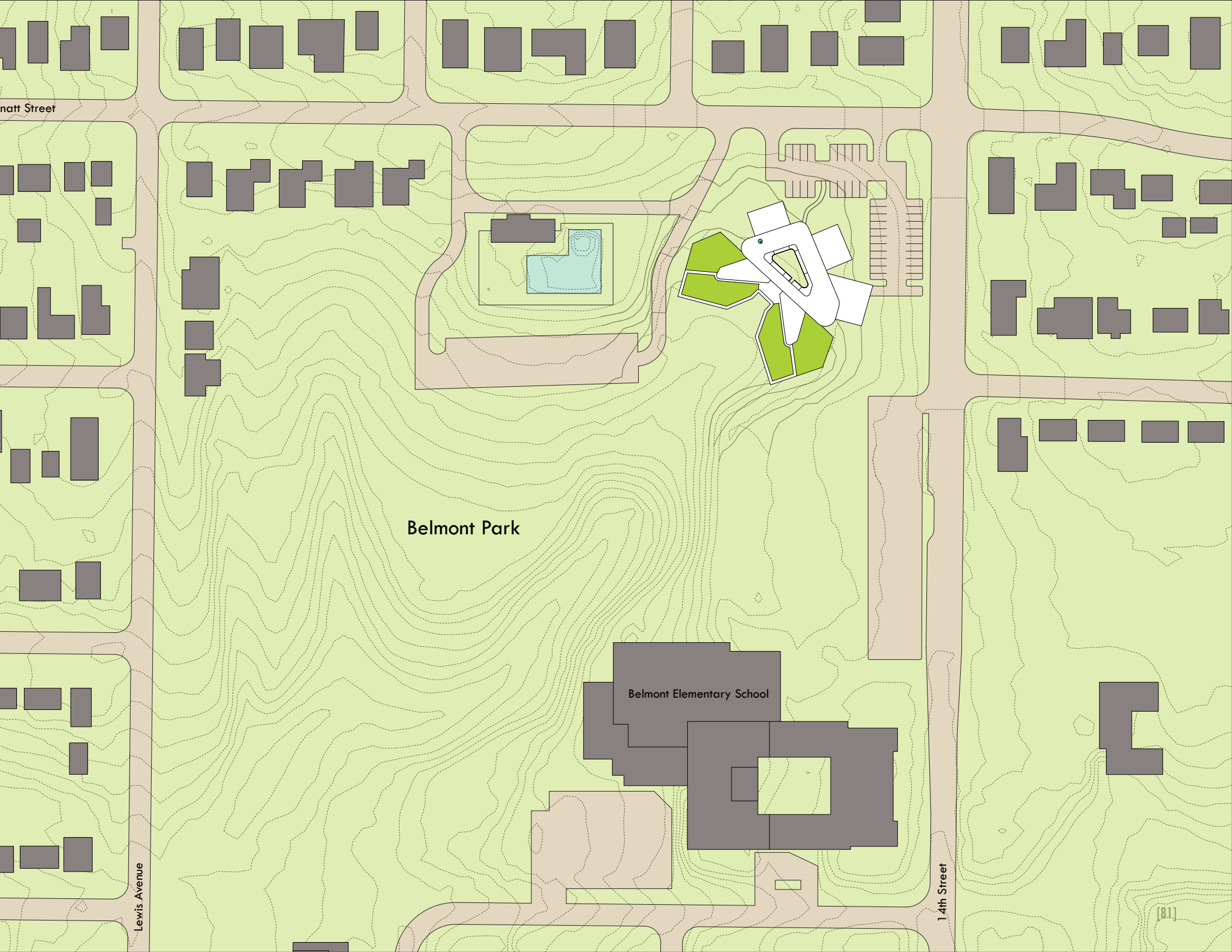


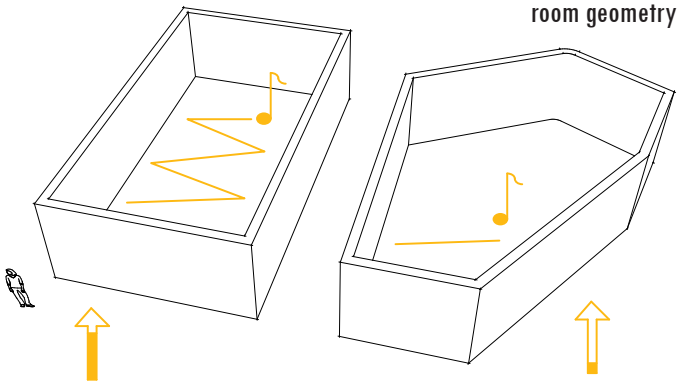
This diagram illustrates putting together the concepts of the edge conditions with the concepts of natural vs. rigid form and materials. Interactions with nature encourage environmental awareness while interactions within the interior encourage social awareness.

final proposal

SITE PLAN
1/128”=1’

An infill site, as an addition to an existing elementary school will allow the early learning center to become part of the community’s existing infrastructure, serving as a case study for the argument of early learning as an imperative societal issue. Located on the northeast corner of Belmont Park, the early learning center takes advantage of the views of nature as well as accessibility from 14th Street.


natt Street
Belmont Park
Belmont Elementary School
Lewis Avenue
14th Street



PLAN
1/32”=1’

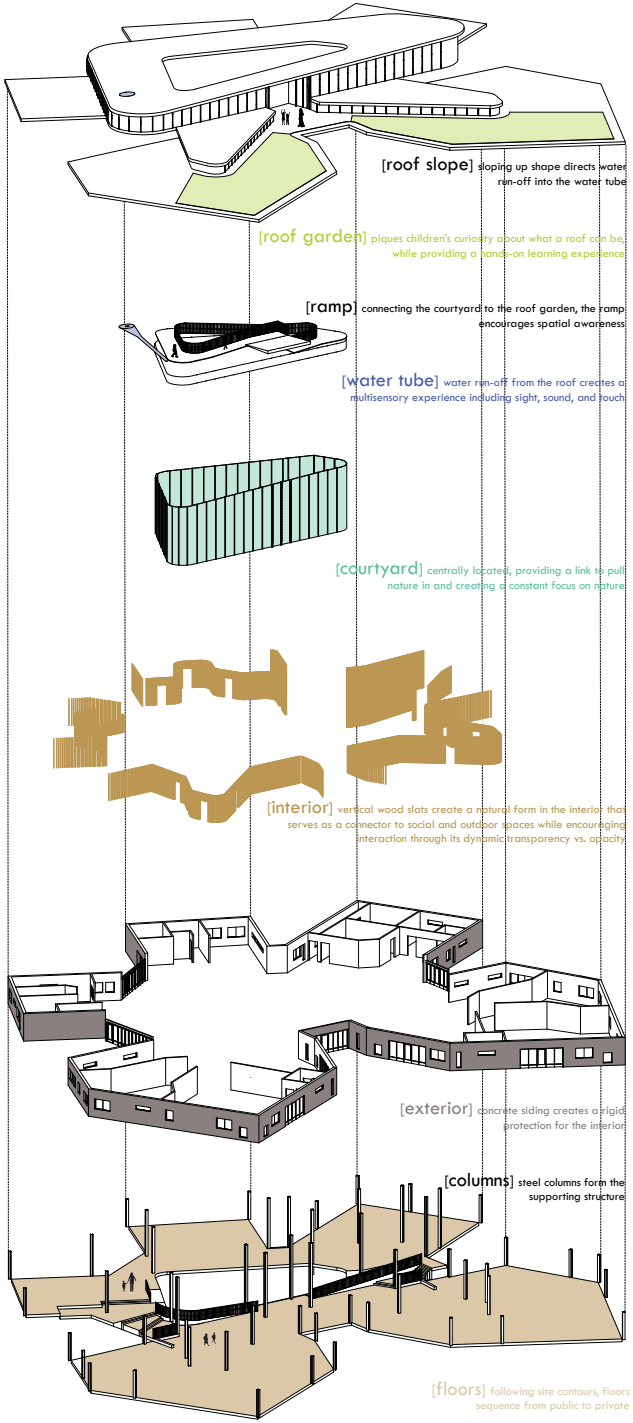
The concept of edge conditions for the overall form is repeated on the interior in the individual rooms. In addition to its acoustic factor, non-linear rooms create more places for learning to take place. In the common area, the ramps follow the natural contours of the site, sequencing from the public spaces to private spaces. Another ramp is present in the central courtyard, accessible from the dining area, connecting to the roof garden.


teacher resource
conference
administration
custodian
rec.
entry
women
parents
men
large meeting
infants
[8 children]
toddlers
[10 children]
central courtyard
4-5 years
[18 children]
3 years
[14 children]
common area
dining/motor play
kitchen
mechanical/electrical
storage
service entry
3 years
infants
toddlers
4-5 years

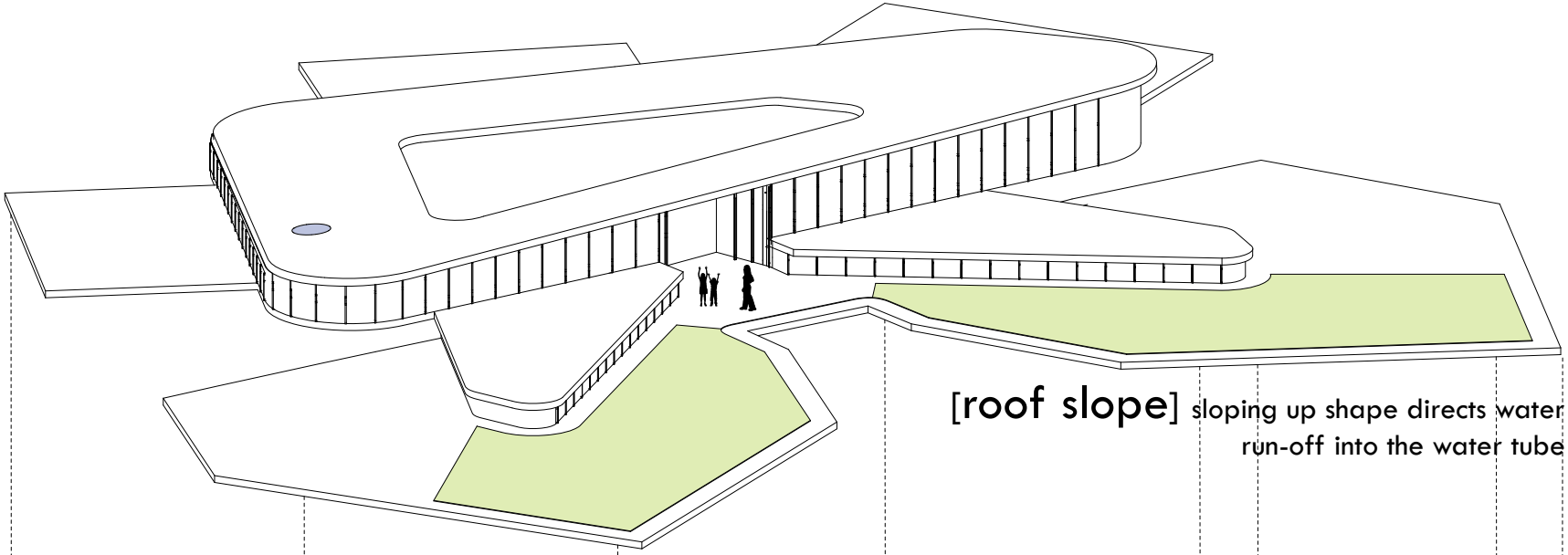
SECTION

1/16”=1’

physical model


[roof slope] sloping up shape directs water run-off into the water tube
[roof garden] piques children's curiosity about what a roof can be, while providing a hands-on learning experience
[ramp] connecting the courtyard to the roof garden, the ramp encourages spatial awareness
[water tube] water run-off from the roof creates a multisensory experience including sight, sound, and touch
[courtyard] centrally located, providing a link to pull nature in and creating a constant focus on nature
[interior] vertical wood slats create a natural form in the interior that serves as a connector to social and outdoor spaces while encouraging interaction through its dynamic transparency vs. opacity
[exterior] concrete siding creates a rigid protection for the interior
[columns] steel columns form the supporting structure
[floors] following site contours, floors sequence from public to private

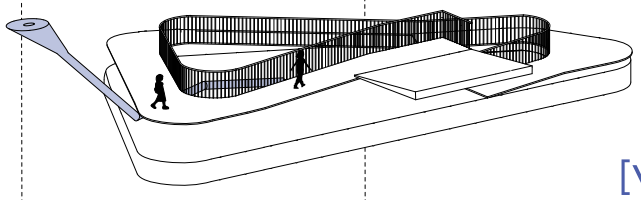
elements of design



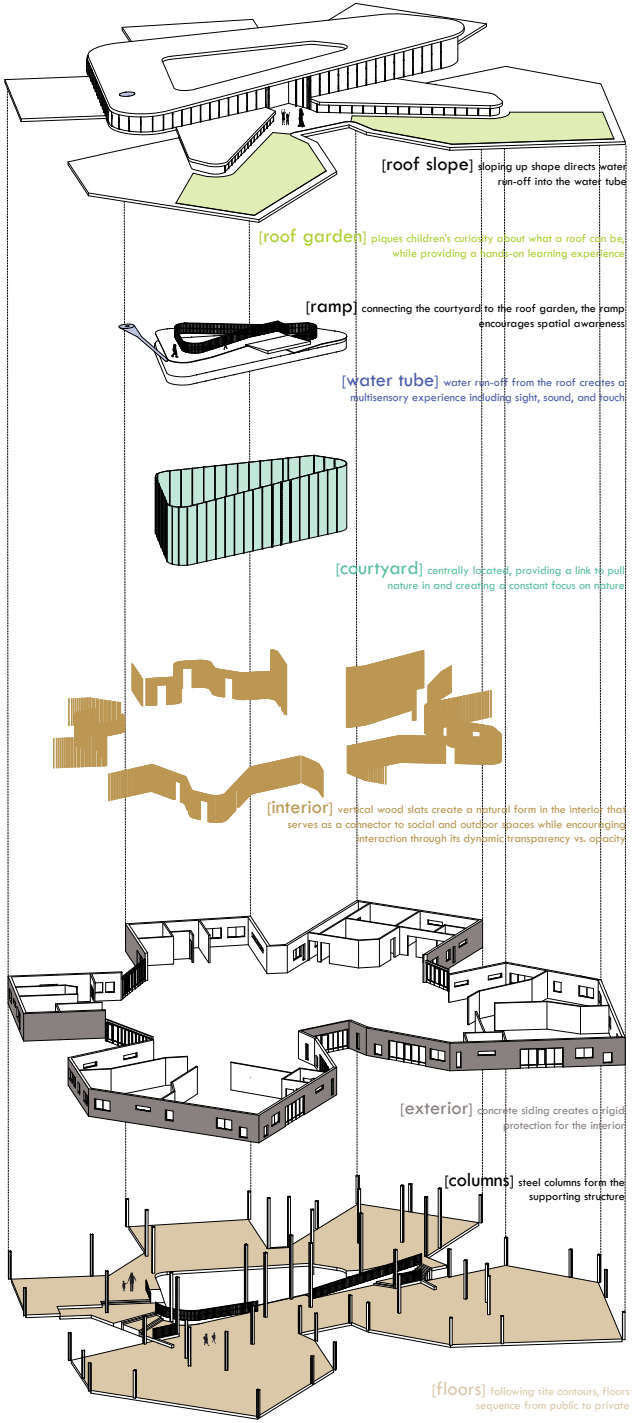
[roof slope] sloping up shape directs water run-off into the water tube

[roof garden] piques children's curiosity about what a roof can be, while providing a hands-on learning experience

[ramp] connecting the courtyard to the roof garden, the ramp encourages spatial awareness



[water tube] water run-off from the roof creates a multisensory experience including sight, sound, and touch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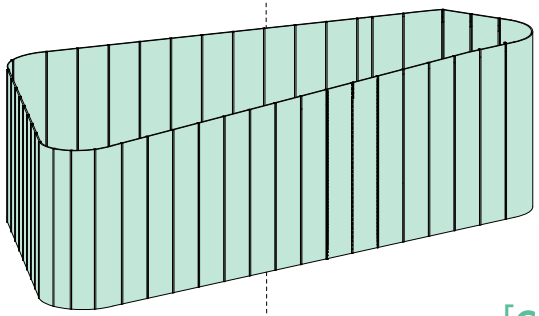
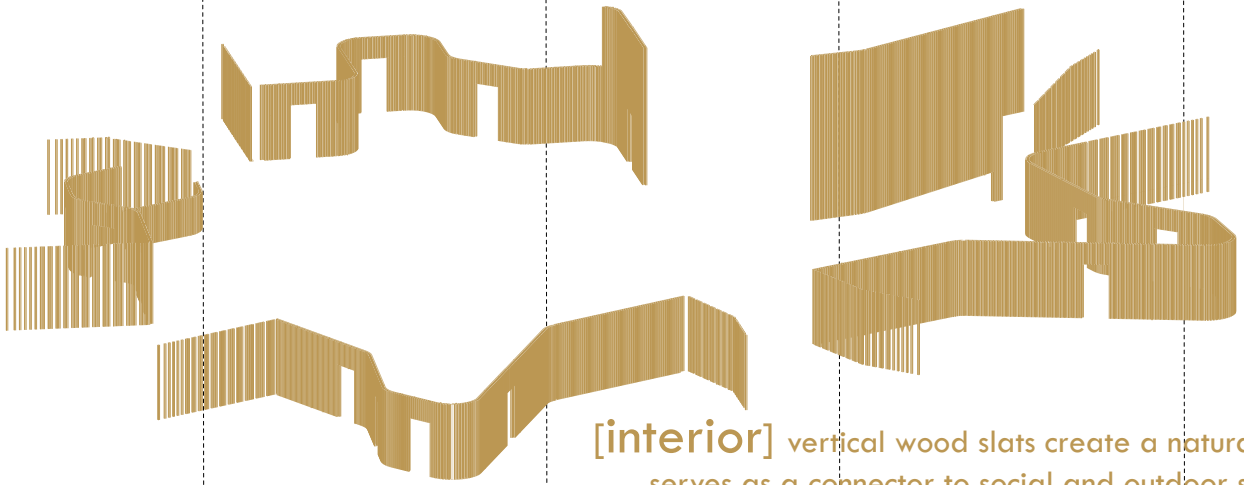
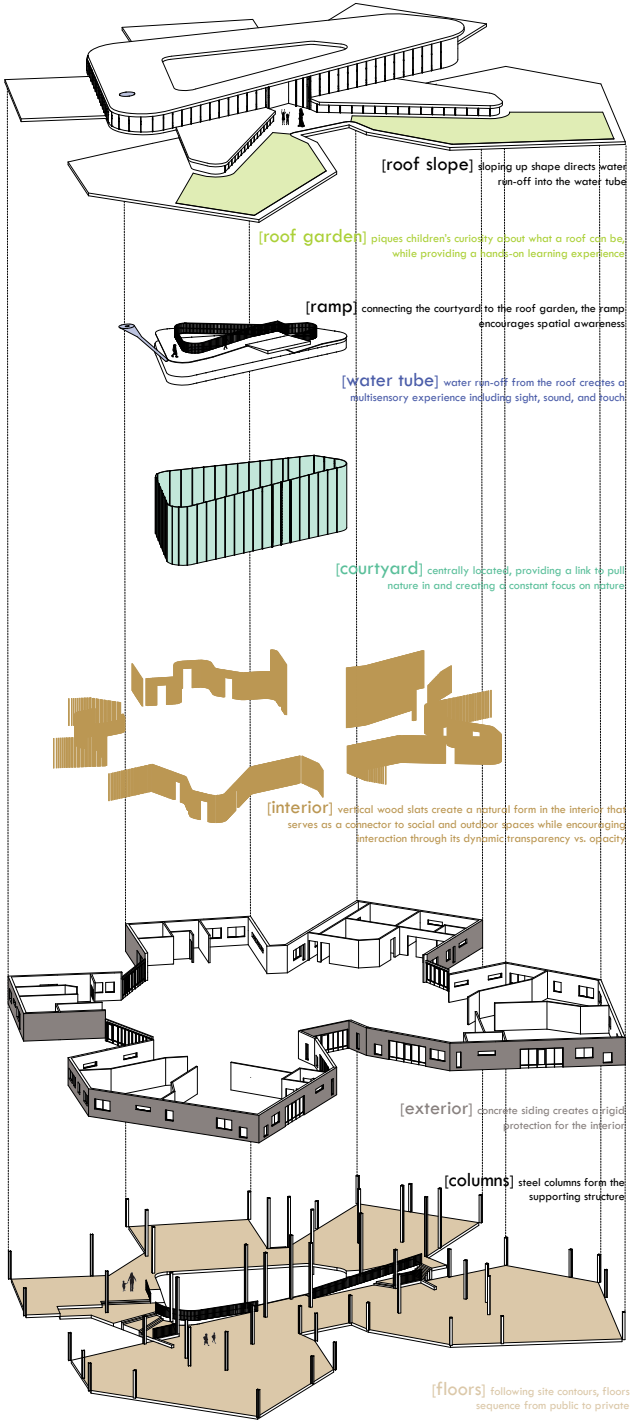
[columns] steel columns form the supporting structure
[floors] following site contours, floors sequence from public to private



[courtyard] centrally located, providing a link to pull nature in and creating a constant focus on nature



[interior] vertical wood slats create a natural form in the interior that serves as a connector to social and outdoor spaces while encouraging interaction through its dynamic transparency vs. opacity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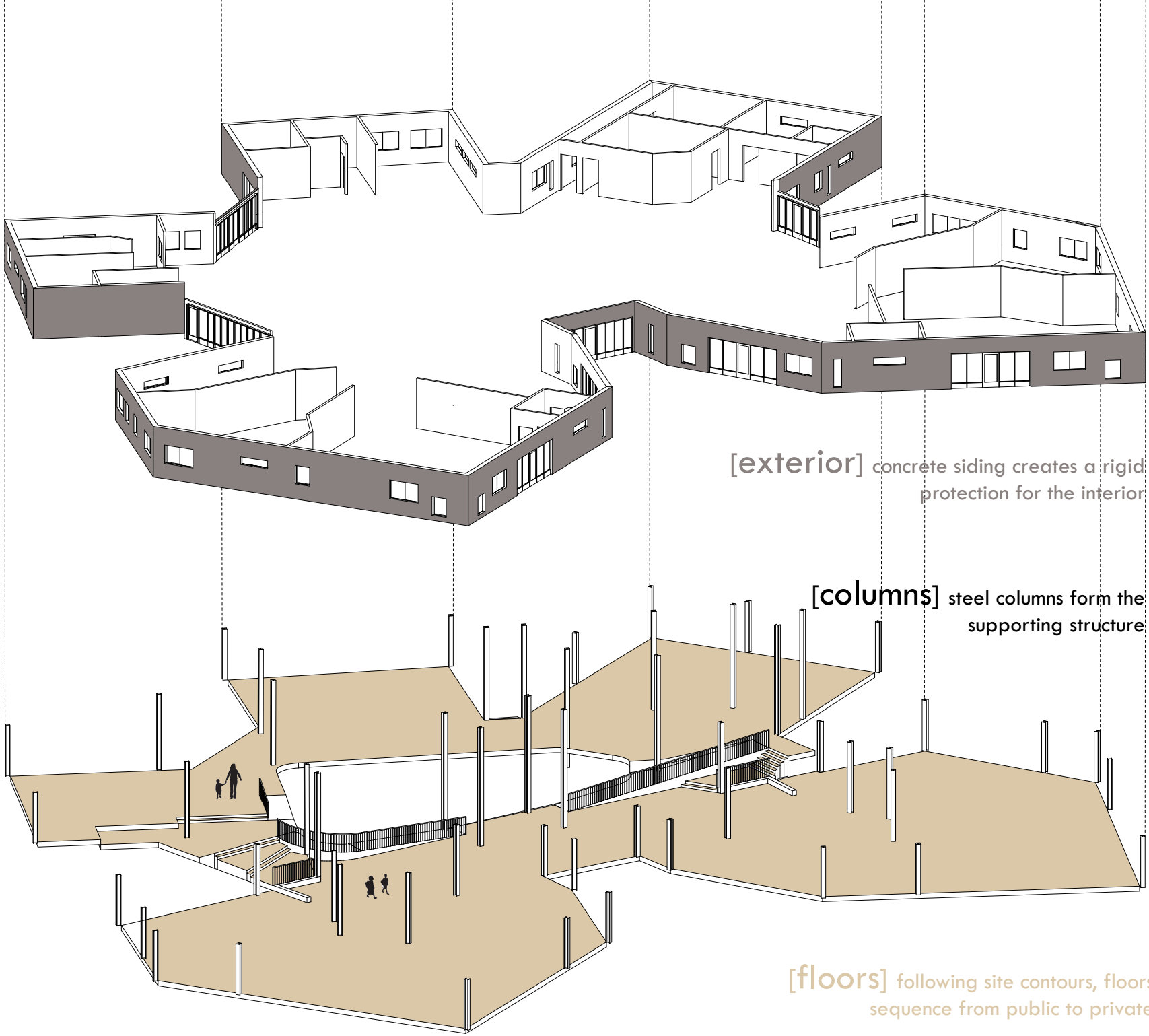

[exterior] concrete siding creates a rigid protection for the interior
[columns] steel columns form the supporting structure
[floors] following site contours, floors sequence from public to private

entry exterior

The front entry serves as a transparent threshold, creating an inviting environment for children as they approach the center. Its apparent from the front entry that nature is infused in the building.

entry interior

The constant view of the courtyard assists with orientation and wayfinding, providing **control**. The water tube collects filtered rainwater from the roof, allowing children to experience water in a unique way while creating a relaxing feature in the common area.

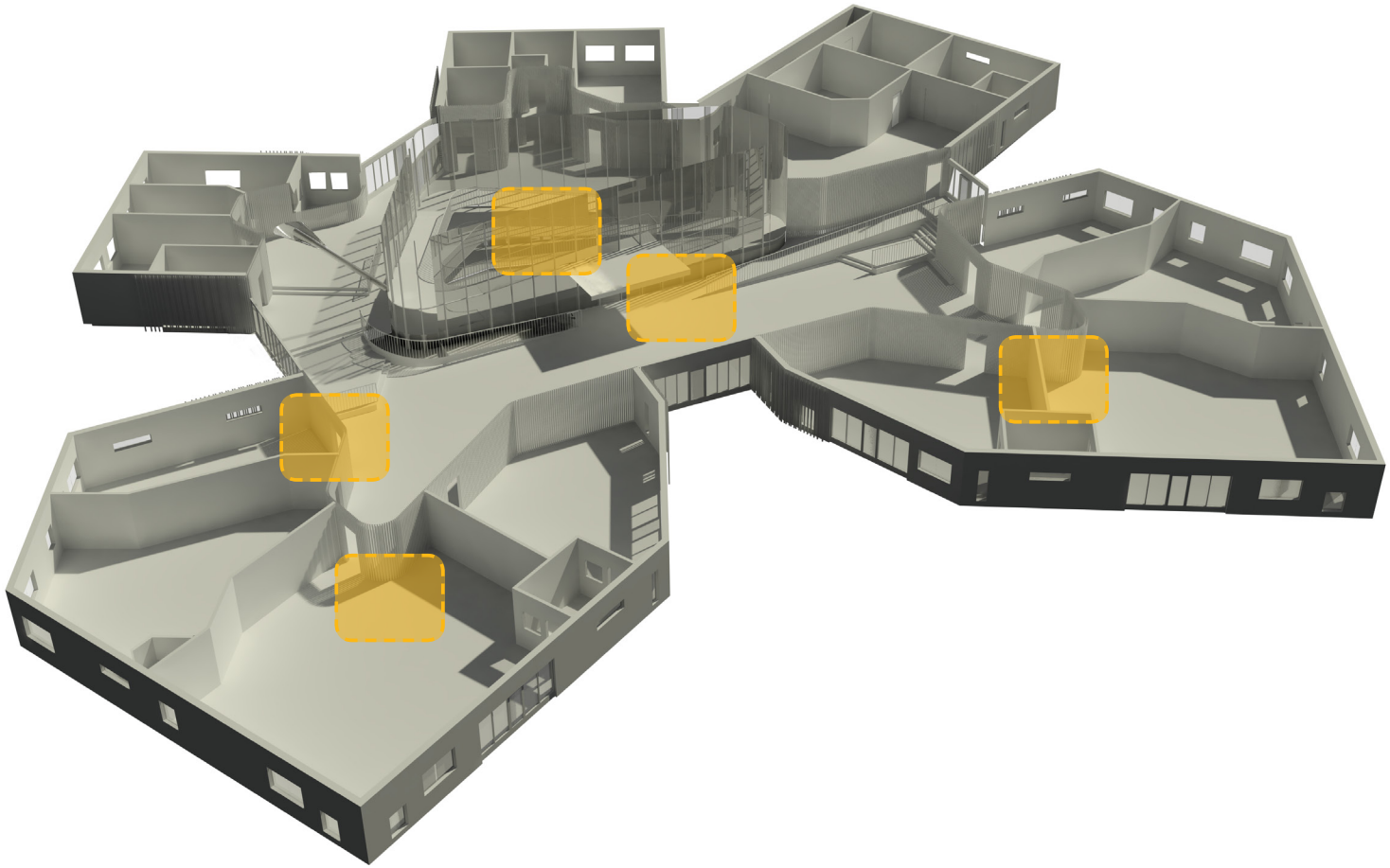
common area

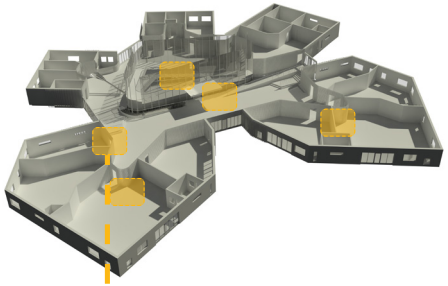
The common area is an interconnected space providing views of multiple levels of learning while exposing children to different spatial complexities. The space encourages social interaction of multiple age levels.

outdoor play area

Window heights are placed according to the heights of children, with wood window frames creating a connection from the interior to the exterior. Orientation to the exterior provides control, with views offering **physical** and **emotional** healing benefits, as well as **cognitive** benefits of increasing their knowledge of the natural world. Lower windows not only frame views specifically for children, but also create window seats for the children to inhabit.

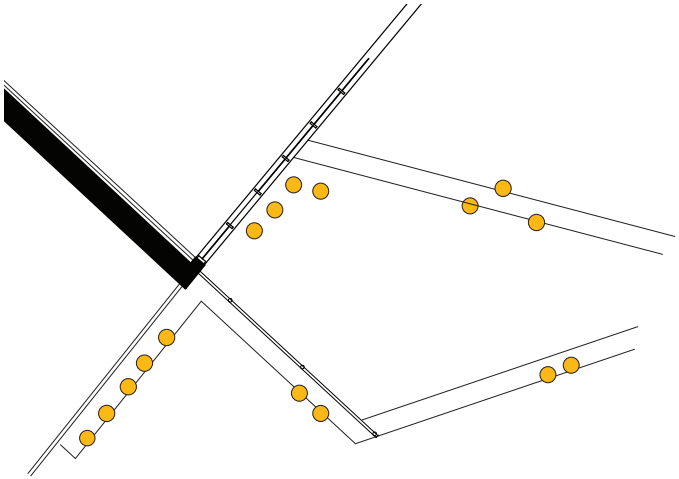
moments of learning

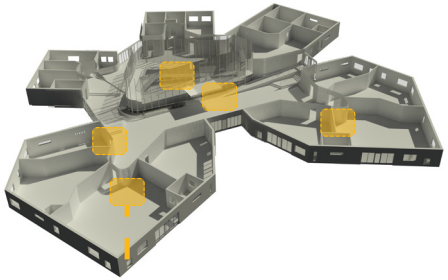




A variety of spaces provides opportunities for small and large group learning, offering comfort in creating separate “places.”

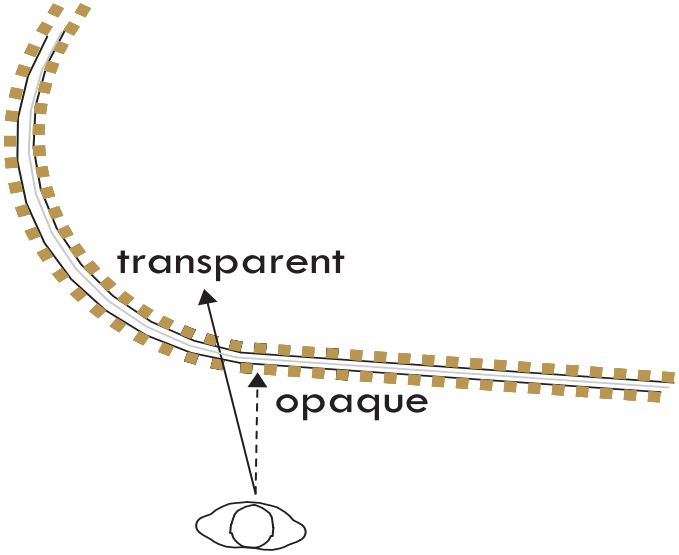
[Is this a step or a seat?]

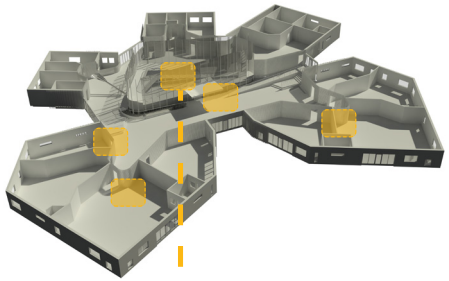




Vertical wood slats provide a multisensory experience including the senses of sight, touch, smell, and sound while also creating a dynamic experience of a changing perspective as a child moves along the wall. The cool green color of the children's room serves as a contrast to the warm color of the wood.

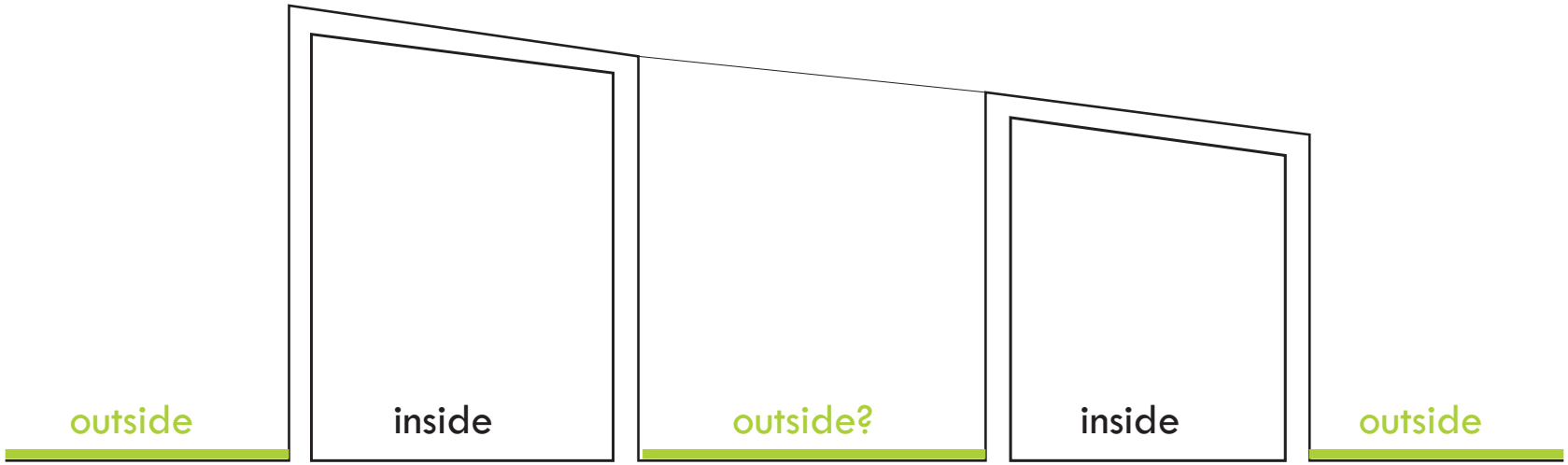
[Is this a wall or a window?]



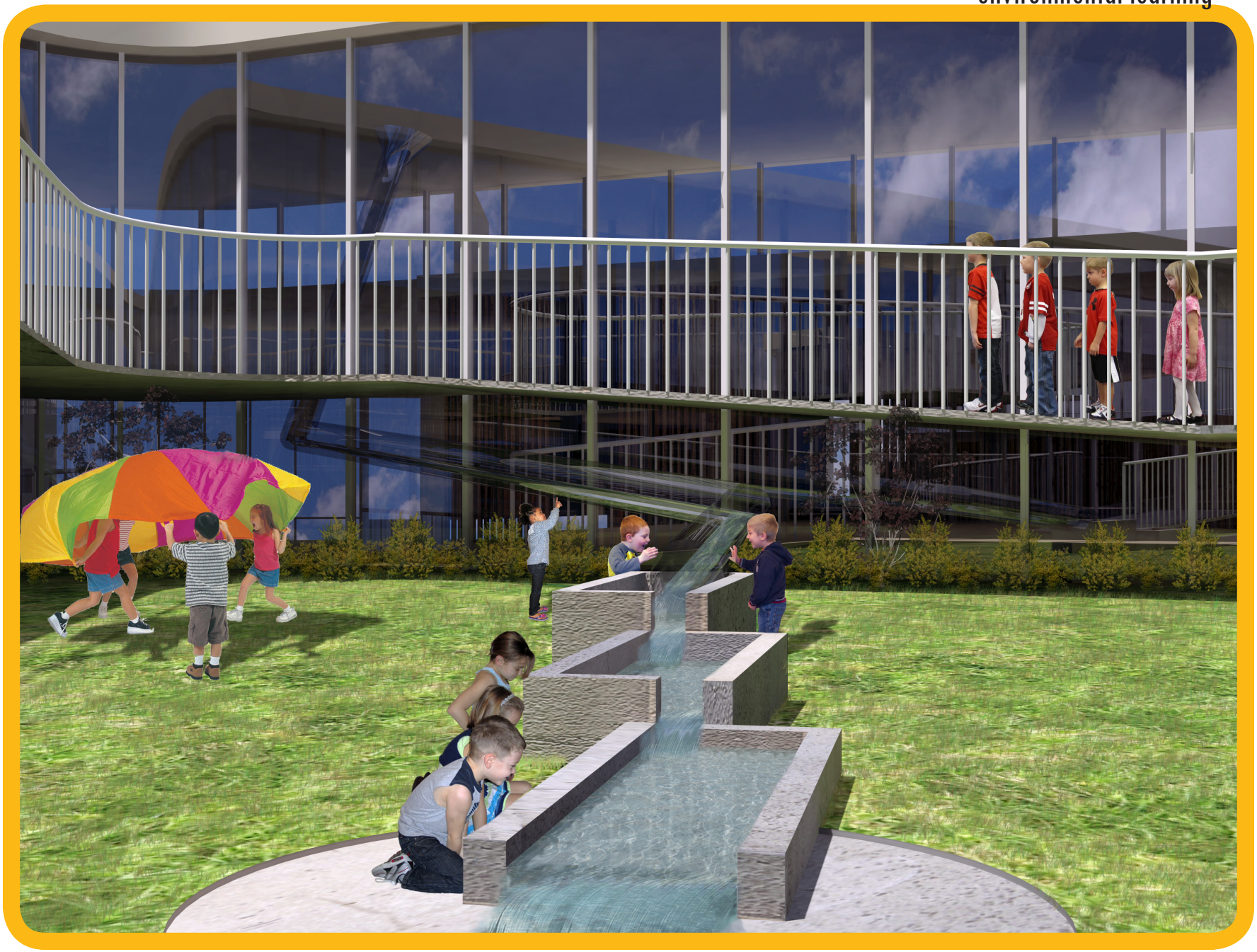


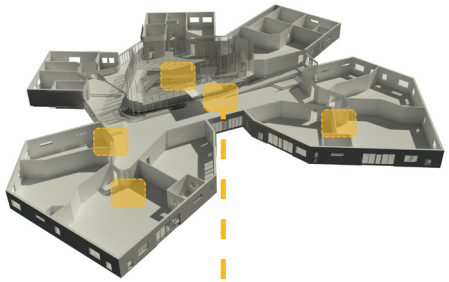
The central courtyard pulls nature into the interior while piquing a child's curiosity of inside vs. outside. The water feature allows children to experience flowing water using their senses of sight, sound and touch.

[Are we inside or outside?]



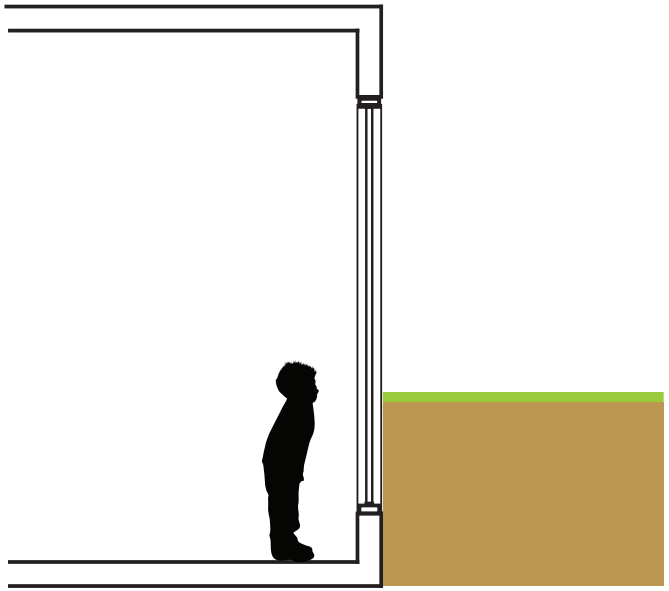
environmental learning

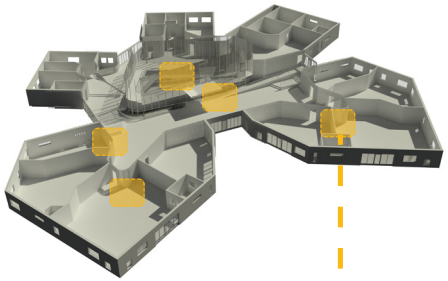




Exposed earth in the common area gives children a first-hand view of the earth in a way that they would not normally experience. Unveiling not only the layers of the earth, but the ecology that takes place just below their feet.

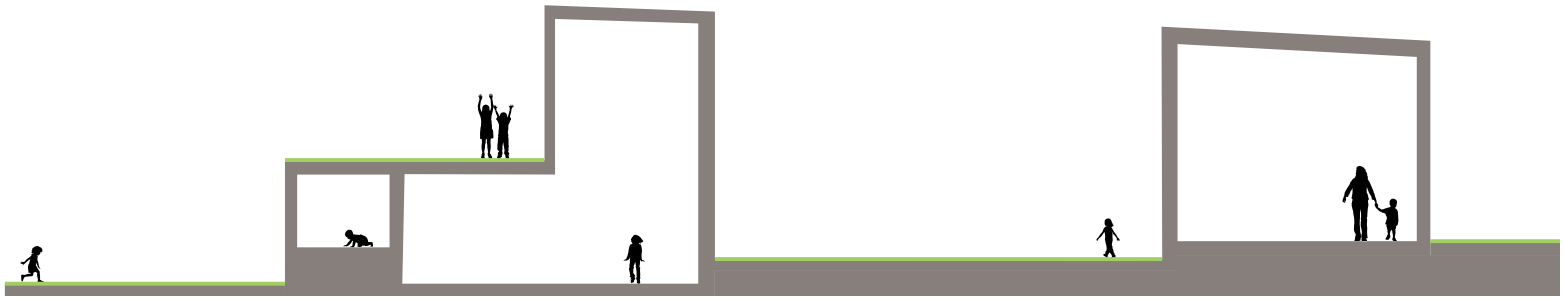
[Are we above ground or below?]





The roof garden provides learning opportunities for gardening while providing a multisensory space including sight, touch, smell, and taste. For example, petunias attract butterflies, creating a ecological learning opportunity. The green roof also allows children to relate to the activities taking place on multiple levels.

[Is it a garden or a roof?]



learning garden

looking back

While serving as a case study showing how architecture can be used as an educational aid in early learning, the result of my thesis raised as many questions, if not more, than it answered. The final proposal of place [for] the children is a mere snapshot into the possibilities of how architecture can have an impact on the education and growth of children. If nothing else, I hoped to have opened someone's eyes to the importance of the environment on a child's development. Slowly, early childhood design is gaining recognition and beginning to receive the attention that is deserves.

As mentioned earlier, children absorb every aspect of the environment, leaving no detail too small for design. I often found it difficult to devote the same amount of rigor and design to elements ranging from the overall form of the building down to the details of the handrails. Knowing that learning occurs everywhere, it was a challenge to design every aspect of my project to the degree necessary for my chosen program of an early learning center.

This thesis experience was unlike any other that I have had in my academic career. Through this process, I have learned lessons about myself, as a designer, that will be invaluable to me as I move forward in the profession.

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